actron®

CP9185
CP9190

actron
Elite AutoScanner® Pro
CP9190
HELP
ENTER

Elite AutoScanner®
Elite AutoScanner® Pro

P/N 0002-001-2933

Scan Tool Information

Complete the following list using the function “**Tool Information**”. Provide this information when contacting customer support.

Serial No: ____________________

SW ID: ____________________

HW Ver: ____________________

Boot Ver: ____________________

Prod ID: ____________________

Board ID: ____________________

Burn Date: ____________________

Burn Loc: ____________________

If you have questions or concerns Contact **Technical Support**:

- **Phone:** 1-800-228-7667
- Website: www.actron.com
- **Mail:** SPX Service Solutions
- 15825 Industrial Parkway
- Cleveland, Ohio 44135
- Attn: Technical Support

Copyright Information

Copyright © 2006-2007 SPX Corporation

All rights reserved.

The information, specifications and illustrations in this guide are based on the latest information available at the time of printing. ***SPX Corporation*** reserves the right to make changes at any time without notice.

Table of Contents

Safety Precautions

Important Safety Messages . . . . **Safety - iii**

Section 1 – Using This Manual

Section 2 – Getting Started

Introduction **2-1**
Using the CD **2-2**
  Installing Applications On Included CD 2-3
Vehicle Service Information **2-4**
Introduction to On-Board Diagnostics **2-6**
  SAE Publications 2-7
Data Link Connector (DLC) **2-9**
  OBD II (J1962) 2-9
  Ford Historic 2-10
  GM Historic 2-13
  Chrysler Historic 2-14
OBD II Diagnostic Trouble Codes (DTCs) **2-15**

Section 3– Using The Scan Tool

The Scan Tool **3-1**
  Specifications 3-2
  Accessories for the Scan Tool 3-3
  Display 3-4
  Keypad 3-4
  Power 3-5
Scan Tool Power UP **3-7**
System Setup **3-7**
  Changing Measurement Units 3-8
  Changing Display Contrast 3-9
  Beeper 3-10
  Changing Auto-Power Off 3-11
  View Tool Information 3-12
  Display Test 3-13
  Keyboard Test 3-15
  Memory Test. 3-15
  Program Mode 3-17
Connecting The Scan Tool. **3-17**
  Review Data 3-18
  Playback 3-19
  Print Data 3-21

Code Lookup. 3-23
Setup User Key. 3-26
Vehicle Selection 3-27

Section 4 – Global OBD II Diagnostics

Global OBD II Diagnostics 4-1
Global Function List 4-2
Datastream Menu 4-3
View Data 4-4
Record Data 4-9
Diagnostic Codes Menu 4-12
Read Codes 4-12
Pending Codes 4-14
Erase Codes 4-16
View Freeze Data 4-18
Special Tests Menu 4-19
I/M Readiness 4-20
Drive Cycle Monitor 4-23
State OBD Check 4-26
O2 Monitor Test 4-27
Diagnostic Monitor Tests 4-30
On-Board Systems 4-33
Vehicle Info 4-34
Modules Present 4-37

Section 5 – GM Diagnostics

GM Historic (OBD I) Diagnostics 5-1
GM Function List. 5-1
Datastream Menu 5-2
View Data 5-3
Record Data 5-4
Diagnostic Codes Menu 5-6
Read Codes 5-7
Erase Codes 5-8
Special Tests Menu 5-10
Field Service 5-11
GM Enhanced (OBD II) Diagnostics. 5-14
GM Function List for OBD II 5-16
Diagnostic Codes Menu 5-16
Read Codes 5-16
Erase Codes 5-18

Section 6 – Ford Diagnostics

Ford Historic (OBD I) Diagnostics 6-1
Ford Function List 6-1
Datastream Menu 6-3
View Data 6-3
Record Data 6-4

Diagnostic Codes Menu 6-6
Read KOEO Codes 6-7
Read KOER Codes 6-9
Erase Codes. 6-13
IVSC-Speed Ctrl (EEC_IV Vehicles) 6-16
On Demand Test Menu. 6-19
Wiggle Test (EEC_IV Vehicles) 6-20
Output Switch Test (EEC_IV Vehicles) 6-22
Cylinder (Cyl) Balance Test (EEC_IV Vehicles). 6-24
STAR Test Mode (EEC_IV, MECS and MCU Vehicles). 6-27
Ford Enhanced (OBD II) Diagnostics 6-29
Ford Function List. 6-29
Diagnostic Codes Menu. 6-31
Read Codes 6-31

Section 7 – Chrysler Diagnostics

Chrysler Diagnostics 7-1
Chrysler Function List. 7-1
Datastream Menu 7-4
View Data 7-4
Record Data 7-6
Sensor Test 7-7
Diagnostic Codes Menu. 7-8
Read Codes 7-8
Erase Codes. 7-10
Device Controls Menu 7-11
Switch Test. 7-11
Actuator Test 7-12
Idle Speed Test 7-14

Section 8 – Import Diagnostics

Import (OBD II) Diagnostics. 8-1
Import Function List 8-1
Diagnostic Codes Menu. 8-2
Read Codes 8-3

Section 9 – Troubleshooting

How to Use On-Line Help. 9-1
Error Messages. 9-2
Scan Tool Does Not Power Up 9-2
Vehicle Communication Fault 9-3
Operating Error or Erroneous Data 9-4
Battery Replacement 9-5
Tool Self-Tests 9-6
Technical Support. 9-6

Appendix A – PID Definitions

Appendix B – Data Link Connectors

Appendix C – Glossary

ToC

Safety Precautions

For your safety, read this manual thoroughly before operating your Scan Tool. Always refer to and follow safety messages and test procedures provided by the manufacturer of the vehicle or equipment being tested.

The safety messages presented below and throughout this user's manual are reminders to the operator to exercise extreme care when using this test instrument.

Read All Instructions

Read, understand and follow all safety messages and instructions in this manual and on the test equipment. Safety messages in this section of the manual contain a signal word with a three-part message and, in some instances, an icon.

Safety Messages

Safety messages are provided to help prevent personal injury and equipment damage. All safety messages are introduced by a signal word. The signal word indicates the level of the hazard in a situation. The types of safety messages are.

⚠DANGER	**Indicates a possible hazardous situation which, if not avoided, will result in death or serious injury to operator or bystanders.**
⚠WARNING	**Indicates a possible hazardous situation which, if not avoided, could result in death or serious injury to operator or bystanders.**
⚠CAUTION	**Indicates a possible hazardous situation which, if not avoided, may result in moderate or minor injury to operator or bystanders.**
IMPORTANT	**Indicates a condition which, if not avoided, may result in damage to test equipment or vehicle.**

Type Styles Used:

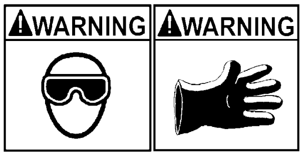
Safety messages contain three different type styles.

- Normal type states the hazard.
- **Bold** type states how to avoid the hazard.
- *Italic* type states the possible consequences of not avoiding the hazard.

Icons used:

An icon, when present, gives a graphical description of a potential hazard.

Example:

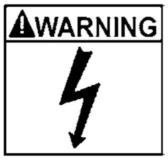


Engine systems can malfunction expelling fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris.

Safety goggles and protective gloves must be worn by the operator and any bystanders. Even if everyday eyeglasses have impact resistant lenses, they are NOT safety glasses.

Engine systems that malfunction can cause injury.

Important Safety Messages

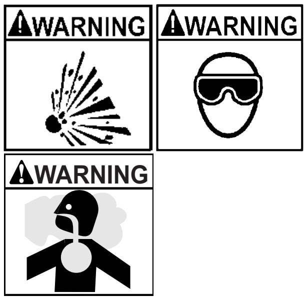


Risk of electric shock.

- **Do not exceed voltage limits between inputs indicated in the Specifications.**

- **Use extreme caution when working with circuits that have voltage greater than 60 volts DC or 24 volts AC.**

Electric shock can cause injury.



Risk of explosion.

- **Safety goggles and protective clothing must be worn by the operator and any bystanders.**
  - Even if everyday glasses have impact resistant lenses, they are NOT safety glasses, and may not provide adequate protection.

- **Do not use this scan tool in environments where explosive vapors may collect. These areas include:**
  - below-ground pits.
  - confined areas.
  - areas that are less than 18 inches above floor.

- **Use this Scan Tool in locations with mechanical ventilation providing at least 4 air changes per hour.**

- **Flammable fuel and vapors can ignite.**

- **Do not smoke, strike a match, or cause a spark in the vicinity of the battery. Battery gases can ignite.**

- **Avoid making an accidental connection between the battery terminals. Do not place uninsulated metal tools on the battery.**

- **When removing battery cables, remove the ground cable first.**

- **Avoid sparks when connecting or disconnecting power leads to the battery.**

- **Make sure ignition is off, headlights and other accessories are off and vehicle doors are closed before disconnecting the battery cables.**
  - This also helps prevent damage to on-board computer systems.

- **Always disconnect the battery ground connections before servicing electrical system components.**

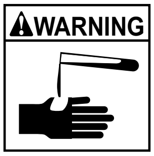
Explosion can cause injury.

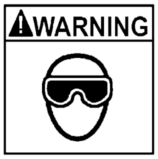
Risk of poisoning.

- **Use this Scan Tool in locations with mechanical ventilation providing at least 4 air changes per hour. Engine exhaust contains odorless gas which can be lethal.**

- **Route the exhaust outside while testing with the engine running.**

Poisoning can result in death or serious injury.





Battery acid is a highly corrosive sulfuric acid.

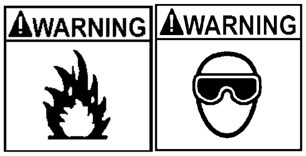
- **Safety goggles and protective gloves must be worn by the operator and any bystanders.**
  - Even if your everyday glasses have impact resistant lenses, they are NOT safety glasses, and may not provide adequate protection.

- **Make sure someone can hear you or is close enough to provide aid when working near a battery.**

- **Have plenty of fresh water and soap nearby.**
  - If battery acid contacts skin, clothing, or eyes, flush exposed area with soap and water for 10 minutes. Seek medical help.

- **Do not touch eyes while working near battery.**

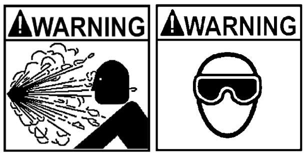
Battery acid can burn eyes and skin.



Risk of fire.

- **Safety goggles and protective clothing must be worn by the operator and any bystanders.**
  - Even if your everyday glasses have impact resistant lenses, they are NOT safety glasses, and may not provide adequate protection.
- **Do not position your head directly in front of or over the throttle body.**
- **Do not pour gasoline down the throttle body when cranking or running the engine, when working with fuel delivery systems or any open fuel line.**
  - Engine backfire can occur when the air cleaner is out of position.
- **Do not use fuel injector cleaning solvents when performing diagnostic testing.**
- **Keep cigarettes, sparks, open flame and other sources of ignition away from vehicle.**
- **Keep a dry chemical (Class B) fire extinguisher rated for gasoline, chemical and electrical fires in work area.**

Fire can cause death or serious injury.



Risk of flying particles.

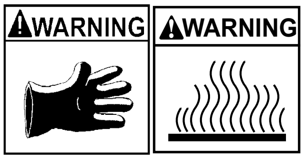
- **Safety goggles and protective gloves must be worn by the operator and any bystanders while using electrical equipment.**
  - Electrical equipment or rotating engine parts can cause flying particles.
  - Even if your everyday glasses have impact resistant lenses, they are NOT safety glasses, and may not provide adequate protection.

Flying particles can cause eye injury.

Risk of burns.

- **Batteries can produce a short-circuit current high enough to weld jewelry to metal.**
  - Remove jewelry such as rings, bracelets and watches before working near batteries.

Short circuits can cause injury.



Risk of burns.

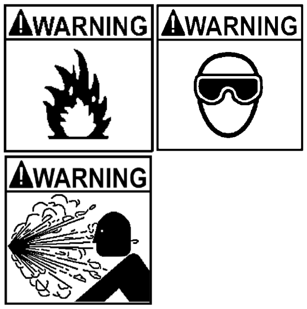
- **Do not remove radiator cap unless engine is cold.**
  - Pressurized engine coolant may be hot.

- **Do not touch hot exhaust systems, manifolds, engines, radiators, sample probe.**

- **Wear insulated gloves when handling hot engine components.**

- **Tester leads can become hot after extended testing in close proximity to manifolds.**

Hot components can cause injury.

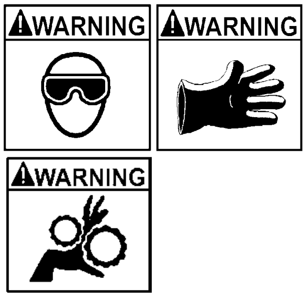


Risk of expelling fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris.

- **Safety goggles and protective clothing must be worn by the operator and any bystanders.**
  - Even if your everyday glasses have impact resistant lenses, they are NOT safety glasses, and may not provide adequate protection.

- **Engine systems can malfunction, expelling fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris.**

Fuel, oil vapors, hot steam, hot toxic exhaust gases, acid, refrigerant and other debris can cause serious injury.



Engine compartment contains electrical connections and hot or moving parts.

- **Keep yourself, test leads, clothing and other objects clear of electrical connections and hot or moving engine parts.**

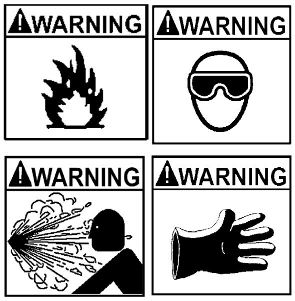
- **Do not wear watches, rings, or loose fitting clothing when working in an engine compartment.**

- **Do not place tools or test equipment on fenders or other places in engine compartment.**

- **Barriers are recommended to help identify danger zones in test area.**

- **Prevent personnel from walking through test area.**

Contacting electrical connections and hot or moving parts can cause injury.



Risk of injury.

- **The Scan Tool should be operated by qualified personnel only.**

- **Use the scan tool only as described in the user's manual.**

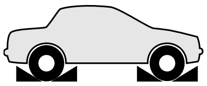
- **Use only manufacturer's recommended attachments.**

- **Do not operate the Scan Tool with damaged cables.**

- **Do not operate the Scan Tool if it has been dropped or damaged, until examined by a qualified service representative.**

Operation of the Scan Tool by anyone other than qualified personnel may result in injury.

WARNING



Risk of unexpected vehicle movement.

- **Block drive wheels before performing a test with engine running.**

- **Unless instructed otherwise:**
  - set parking brake
  - put gear selector in neutral for manual transmissions
  - put gear selector in park for automatic transmissions
  - disconnect release mechanism on the automatic parking brake release for testing and reconnect when testing is completed.

- **Do not leave a running engine unattended.**

A moving vehicle can cause injury.

CAUTION

Risk of equipment or circuit damage.

- **Unless specifically directed by manufacturer, make sure ignition is off before connecting or disconnecting connectors or any vehicle electrical terminals.**

- **Do not create a short between battery terminals with a jumper wire or tools.**

Improper equipment use can cause equipment or circuit damage.

⚠CAUTION

Misdiagnosis may lead to incorrect or improper repair and/or adjustment.

- **Do not rely on erratic, questionable, or obviously erroneous test information or results.**
  - If test information or results are erratic, questionable, or obviously erroneous, make sure all connections and data entry information are correct and test procedures were performed correctly.
  - If test information or results are still suspicious, do not use them for diagnosis.

Improper repair and/or adjustment may cause vehicle or equipment damage or unsafe operation.

⚠DANGER

Some vehicles are equipped with air bags.

- **Follow service manual warnings when working around air bag components or wiring.**
  - If service manual instructions are not followed, an air bag may deploy unexpectedly, resulting in injury.
  - Note an air bag can still deploy several minutes after ignition key is off (or even if vehicle battery is disconnected) because of a special energy reserve module.

An air bag opening can cause injury.

Section 1 – Using This Manual

This manual contains instructions for the use and setup of your Scan Tool. A table of contents and glossary are provided to make this manual easy to use.

Some of the information shown in text or illustrations is obtained using optional equipment. A Sales Representative can determine option availability.

This section contains a list of conventions used.

Safety Messages

Refer to ***Safety Precautions*** on page Safety - i.

Check Note

A check note provides additional information about the subject in the preceding paragraph.

Example:

✓ English is the default measurement unit.

Equipment Tips and Lists

Equipment tips and lists provide information that applies to specific equipment. Each tip is introduced by this icon r for easy identification.

Example:

☐ Observe all vehicle and/or equipment manufacturer's cautions and warnings when testing with the Scan Tool.

Equipment Damage

Situations arise during testing that could damage the vehicle or the test equipment. The word **IMPORTANT** signals these situations.

Example:

IMPORTANT Failure to follow these instructions could damage the Scan Tool.

Functions and Selections

Diagnostic and tool functions performed by the Scan Tool are highlighted in **bold**.

Example:

The **View Data** function allows you to view the vehicle's parameter identification (PID) data in real time.

Menus

The menus on the Scan Tool display are referenced in the procedures and are highlighted in ***bold-italic*** text.

Example:

When the ***OBDII Function List*** menu displays, the Scan Tool is ready for use.

Questions and Responses

Messages and user responses are CAPITALIZED.

Example:

The Scan Tool displays the pending DTCs or a message stating ***SYSTEM PASS: NO FAULT DETECTED***.

Manual References

Used to reference other sections of the manual. References include the **Title** and page number (section-page).

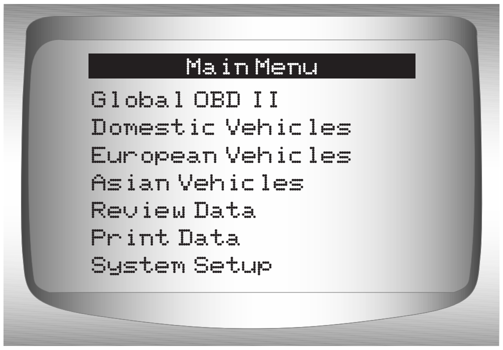
Example:

For more information on DTCs, refer to **"OBD II Diagnostic Trouble Codes (DTCs)**" on page 2-15

Screens

Certain help messages, information, and data that are displayed on the scan tool are also shown in graphical text boxes. The screens are presented as examples and may change as the software is updated.

Example:



Section 2 – Getting Started

Introduction

The Scan Tool was developed by experts in the automotive service industry to help diagnose vehicles and assist in troubleshooting procedures.

The Scan Tool monitors vehicle events and retrieves codes from the vehicle's control modules to help pinpoint problem areas.

All information, illustrations and specifications contained in this manual are based on the latest information available from industry sources at the time of publication.

No warranty (expressed or implied) can be made for its accuracy or completeness, nor is any responsibility assumed by the manufacturer or anyone connected with it for loss or damages suffered through reliance on any information contained in this manual or misuse of accompanying product. The manufacturer reserves the right to make changes at any time to this manual or accompanying product without obligation to notify any person or organization of such changes.

Using the CD

✓ The included CD is **NOT** required to operate the Scan Tool

✓ Install the CD application prior to connecting the Scan Tool to the PC.

✓ Some of the items included on the CD are:

- ❒ Manuals included with Scan Tool
- ❒ DTC lookup software
- ❒ Scan Tool update software
- ❒ Adobe Acrobat Reader Installer
- ❒ Print Capture
- ❒ Other product information

✓ To be able to use the included CD the PC must meet the following minimum requirements:

- ❒ 486 PC
- ❒ 4 MB of RAM
- ❒ Microsoft Windows 98 SE, ME, 2000, and XP
- ❒ CD ROM Drive
- ❒ Adobe Acrobat Reader

❐ Internet Explorer 4.0 or newer

❐ Screen Resolution of 800 x 600

  – If screen resolution is 800 x 600, in Display Properties, Settings Tab, set Font Size to Small Fonts.

Installing Applications On Included CD

1. **Close all programs on the computer.**

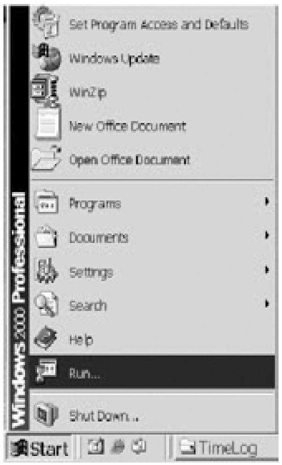
2. **Place the CD in CD-Drive.**

✓ If CD does not start automatically;

❐ Select the ***Start*** button.

❐ Select ***Run...***

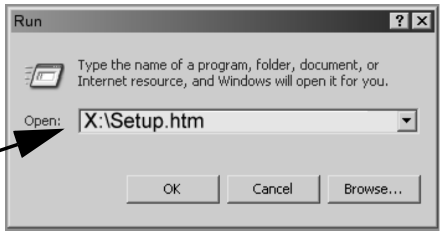
❐ Enter “*X*:\Setup.htm” in Open Box on Computer and select OK.


Set Program Access and Defaults
Windows Update
WinZip
New Office Document
Open Office Document
Programs
Documents
Settings
Search
Help
Run...
Shut Down...
Windows 2000 Professional
Start
TimeLog

Run

Start

❐ “*X*” is the CD-ROM drive letter on the computer.


Run
?
OK
Cancel
Browse...

Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.

Open: X:\Setup.htm

Enter

3. **Follow screen prompts on the computer to install the applications.**

Vehicle Service Information

The following is a list of web sites and phone numbers where electronic engine control (EEC) diagnostic information is available.

✓ Some manuals may be available at your local dealer, auto parts stores or local public libraries.

Domestic Vehicles	Web Site	Phone Number
General Motors		
Chevrolet	www.chevrolet.com	1-800-551-4123
Pontiac	www.pontiac.com	1-800-551-4123
Oldsmobile	www.oldsmobile.com	1-800-551-4123
Buick	www.buick.com	1-800-551-4123
Cadillac	www.cadillac.com	1-800-333-4CAD
Saturn	www.saturn.com	1-800-553-6000
Ford		
Ford	www.ford.com	1-800-392-3673
Lincoln	www.lincoln.com	1-800-392-3673
Mercury	www.mercury.com	1-800-392-3673
Chrysler		
Chrysler	www.chrysler.com	1-800-348-4696
Dodge	www.dodge.com	1-800-348-4696
Plymouth	Not Available	1-800-348-4696
Eagle	Not Available	1-800-348-4696
European Vehicles		
Audi	www.audi.com	1-800-544-8021
Volkswagon	www.vw.com	1-800-544-8021
BMW	www.bmw.com	1-201-307-4000
MINI	www.mini.com	1-201-307-4000
Jaguar	www.jaguar.com	1-800-4-JAGUAR
Volvo	www.volvo.com	1-800-458-1552
Mercedes-Benz	www.mercedes-benz.com	1-800-367-6372
Land Rover	www.landrover.com	1-800-637-6837
Porsche	www.porsche.com	1-800-PORSCHE
Saab	www.saab.com	1-800-955-9007

Asian Vehicles	Web Site	Phone Number
Acura	www.acura.com	1-800-999-1009
Honda	www.honda.com	1-800-999-1009
Lexus	www.lexus.com	1-800-255-3987
Scion	www.scion.com	1.866.70.SCION
Toyota	www.toyota.com	1-800-GO-TOYOTA

Hyundai	www.hyundai.com	1-800-633-5151
Infiniti	www.infiniti.com	1-800-662-6200
Nissan	www.nissanusa.com	1-800-nissan1
Kia	www.kia.com	1-800-333-4542
Mazda	www.mazda.com	1-800-222-5500
Daewoo	www.daewoo.com	1-822-759-2114
Subaru	www.subaru.com	1-800-SUBARU3
Isuzu	www.isuzu.com	1-800-255-6727
Geo	Not Available	Not Available
Mitsubishi	www.mitsubishi.com	1-888-MITSU2004
Suzuki	www.suzukiauto.com	1-800-934-0934

Other Manuals

Chilton Book Company	www.chiltonsonline.com	1-800-347-7707
Haynes Publications	www.haynes.com	1-800-242-4637
Bentley Publishers	www.bentleypublishers.com	1-800-423-4595

Repair Information Programs

Mitchell	www.mitchell1.com	1-888-724-6742
ALLDATA	www.alldata.com	1-800-697-2533

Suitable Manual Titles

Diagnostic Service Manuals

PowerTrain Codes and Oxygen Sensors

Automotive Emission Control Manual

Fuel Injection

Automotive Electrical Manual

Automotive Electrics and Electronics

Automotive Sensors

Electronic Transmission Control

Emission Control Technology

Engine Management

or similar titles...

Introduction to On-Board Diagnostics

OBD I

The original on-board diagnostics (OBD I) lacked consistency in communication and interface while allowing different interpretations among vehicle manufacturers. Ford and Chrysler used different types of engine control computers and data link connectors (DLCs), and GM varied the trouble codes and communication protocols from year-to-year.

OBD II

On-board diagnostics version II (OBD II) is a system that the Society of Automotive Engineers (SAE) developed to standardize automotive electronic diagnosis.

Beginning in 1996, most new vehicles sold in the United States were fully OBD II compliant.

✓ Technicians can now use the same tool to test any OBD II compliant vehicle without special adapters. SAE established guidelines that provide:

- ❒ A universal connector, called the DLC, with dedicated pin assignments.
- ❒ A standard location for the DLC, visible under the dash on driver’s side.
- ❒ A standard list of diagnostic trouble codes (DTCs) used by all manufacturers.
- ❒ A standard list of parameter identification (PID) data used by all manufacturers.
- ❒ Ability for vehicle systems to record operating conditions when a fault occurs.
- ❒ Expanded diagnostic capabilities that records a code whenever a condition occurs that affects vehicle emissions.
- ❒ Ability to clear stored codes from the vehicle’s memory with a Scan Tool.

SAE Publications

SAE has published hundreds of pages of text defining a standard communication protocol that establishes hardware, software, and circuit parameters of OBD II systems. Unfortunately, vehicle manufacturers have different interpretations of this standard communications protocol. As a result, the generic OBD II communications scheme varies, depending on the vehicle. SAE publishes recommendations, not laws, but the Environmental Protection Agency (EPA) and California Air Resources Board (CARB) made many of SAE's recommendations legal requirements that vehicle manufacturers were required to phase in over a three-year period. Beginning in 1994, vehicles with a new engine management computer (about 10% of each manufacturers fleet) were supposed to comply with OBD II standards. For 1995, OBD II systems were to appear on about 40% of the new vehicles sold in the United States. Some of the 1994-1995 OBD II systems were not fully compliant, so the Government granted waivers to give manufacturers time to fine-tune their systems. Beginning in 1996, most of the new vehicles sold in the United States were fully OBD II compliant.

The tables below highlight changes for GM, Ford, and Chrysler. If this seems confusing, don't worry. The Scan Tool makes it easy. Based on the vehicle identification (VIN) information selected during Scan Tool setup, the vehicle is automatically recognized. All you have to do is choose the correct adapter cable and jumper wires (if necessary). Details on adapter cables and jumper wires may be found in **Data LInk Connector** on page 2-9.

GM On-Board Diagnostics

System	Years	Description
OBD I Control Module	1981–1995	Most vehicles used the 12-pin ALDL (Assembly Line Data Link) located under the dash on the driver side. Some 94-95 vehicles used the 16-pin OBD II (J1962) data link connector (DLC), but use the Historical application software. Refer to the vehicle's Vehicle Emission Control Information label.
OBD II Control Module	1994*-Present	Complies with OBD II regulations and uses the J1962 DLC.

* *OBD II system is used on certain 1994-1995 vehicles equipped with a 2.2L, 2.3L, 3.8L, 4.3L or 5.7L engines.*

Ford On-Board Diagnostics

System	Long Name	Years	Description
MCU	Microprocessor Control Unit	1980 –1991	Used in police vehicles, containing carbureted engines. Uses the MCU DLC.
EEC-IV	Electronic Engine Control, Fourth generation	1984 –1995	Most Ford vehicles equipped with North American engines. Uses the EEC-IV DLC.
MECS	Mazda Electronic Control System	1988 –1995	Vehicles equipped with Mazda-sourced engines. Uses MECS 6-pin and 17-pin DLCs.
EEC-V	Electronic Engine Control, Fifth generation	1994* – present	Complies with OBD II regulations and uses the OBD II J1962 DLC.
PTEC	Powertrain Electronic Controller	2000 – present	Complies with OBD II regulations and uses the OBD II J1962 DLC.

** EEC-V OBD II system used in 1994-1995 vehicles equipped with a 3.8L or 4.6L engine.*

Chrysler On-Board Diagnostics

System	Long Name	Years	Description
SMEC	Single Module Engine Controller	1989–1990	Used a 6-pin Serial Communication Interface (SCI) DLC and has bidirectional capability.
SBEC	Single Board Engine Controller	1989*–1995	Used two types of DLCs: a 6-pin SCI and a 6-pin LH series. The first to allow a tool to reset the EMR light on trucks.
OBD II PCM	OBD II Powertrain Control Module	1995**– present	Complies with OBD II regulations and uses the OBD II J1962 DLC.
JTEC	Jeep/Truck Engine Controller	1996– present	Complies with OBD II regulations and uses the OBD II J1962 DLC. The JTEC system is used on light-duty trucks and Jeeps

** In 1989, the SBEC system was installed in selected vehicles with 3.0L V6 engines.*
*** Some vehicles in 1995 were equipped with the OBD II PCM.*

Data Link Connector (DLC)

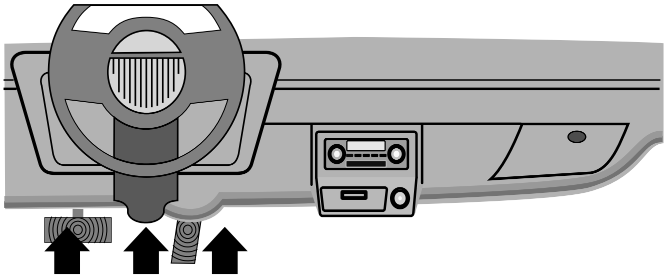
The data link connector (DLC) allows the Scan Tool to communicate with the vehicle's computer(s). Before OBD II, manufacturers used different DLC's to communicate with the vehicle. use the proper DLC adapter cable to connect the Scan Tool to the vehicle. Also, the vehicle's DLC may be found in several different places and have many different configurations. The following describes the DLCs used by Ford, GM and Chrysler. The DLC location and types for domestic vehicles can be looked up in the charts in **Appendix B - Data Link Connectors**.

OBD II (J1962)

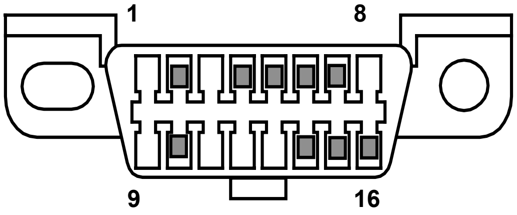
Beginning in 1996, vehicles sold in the United States use the J1962 (OBD II) DLC, a term taken from a physical and electrical specification number assigned by the SAE (J1962). The DLC should be located under the dashboard on the driver's side of the vehicle. If the DLC is not located under the dashboard as stated, a decal describing its location should be attached to the dashboard in the area the DLC should have been located.

Because the OBD II J1962 connector has power and ground, you only need a single cable connection to the tool for both power and tool communications. Attach the OBD II adapter cable to the extender cable, (both supplied with the tool) to connect the tool. Certain pins in the connector are reserved.

.



Data Link Connector (DLC) Pins



1 - Manufacturer Reserved
2 - J1850 Bus+
3 - Manufacturer Reserved
4 - Chassis Ground
5 - Signal Ground
6 - CAN High, J-2284
7 - K Line, ISO 9141-2 & ISO/DIS 14230-4
8 - Manufacturer Reserved
9 - Manufacturer Reserved
10 - J1850 Bus-
11 - Manufacturer Reserved
12 - Manufacturer Reserved
13 - Manufacturer Reserved
14 - CAN Low, J-2284
15 - L Line, ISO 9141-2 & ISO/DIS 14230-4
16 - Battery Power

Ford Historic

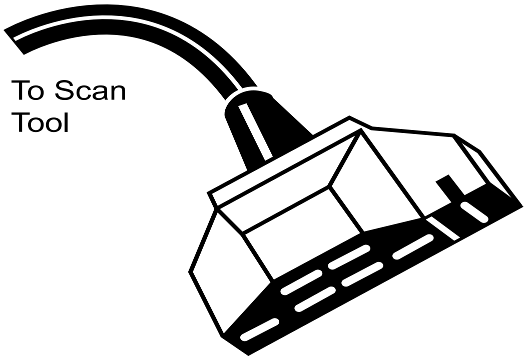
Ford used three types of DLCs with their OBD I systems. Refer to **Appendix B - Data Link Connectors** for the adapter cable needed for your vehicle.

IMPORTANT **Use the cigarette lighter cable to provide power to the Scan Tool for all systems.**

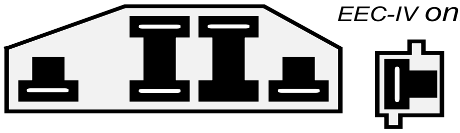
EEC-IV/MCU

The **EEC-IV/MCU** DLC is a large six-sided connector with a pigtail connector. The pigtail connector is not used on MCU vehicles – leave the pigtail unattached. The EEC-IV/MCU cable adapter is included with the Scan Tool.

Cable Adapter
EEC-IV/MCU



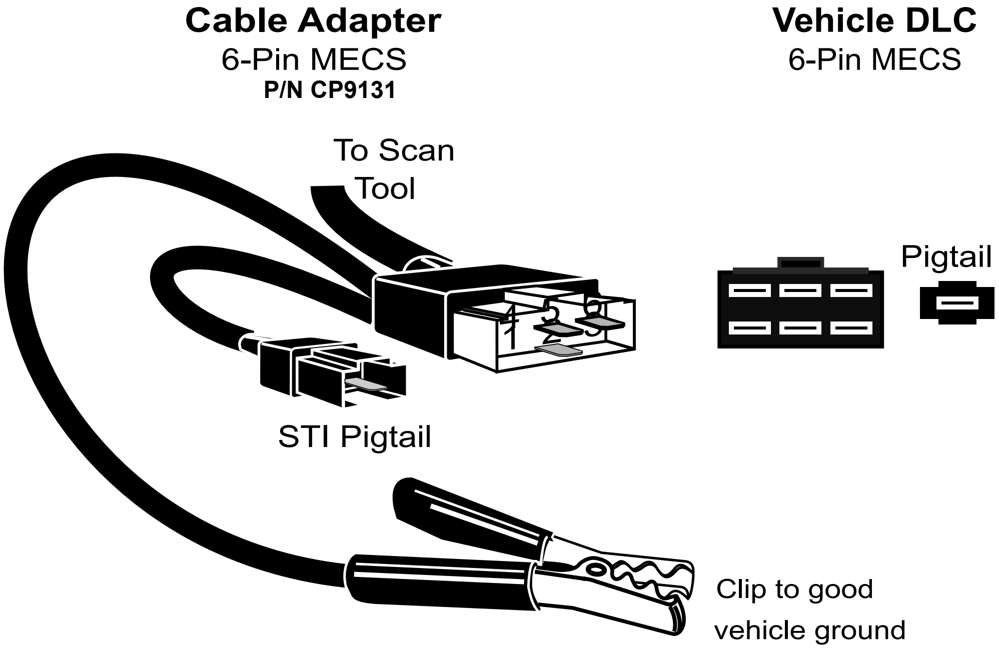
Vehicle DLC
EEC-IV/MCU



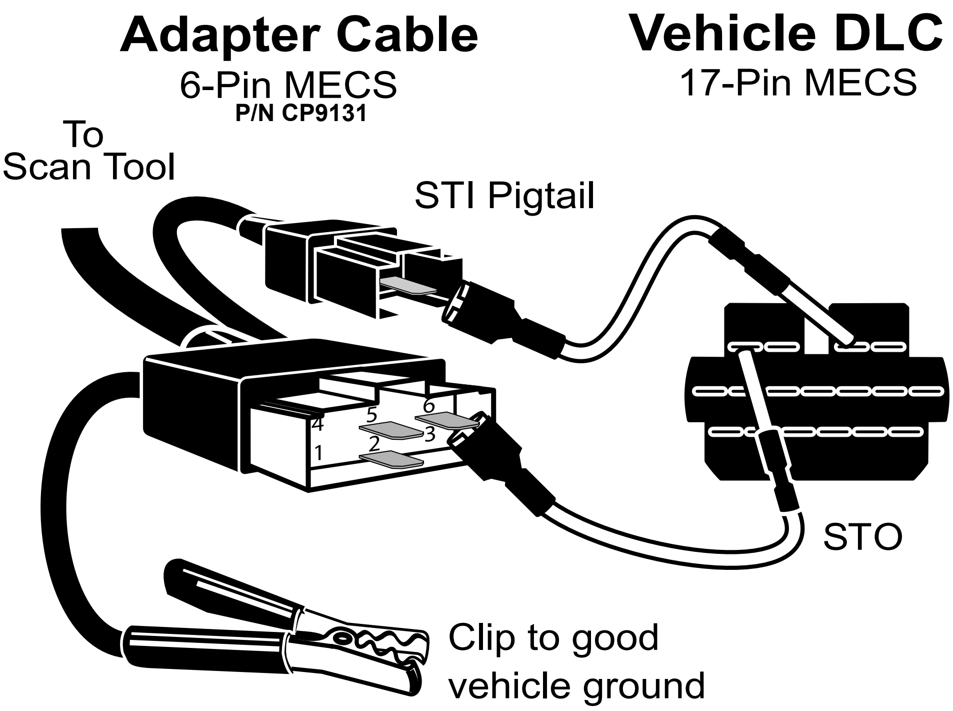
MECS

MECS vehicles (1988 –1995) use either a 6-pin (with pigtail) or a 17-pin DLC. Use the MECS 6-pin adapter cable kit (CP9131) for both configurations. The MECS adapter cable kit includes jumper wires to connect to the MECS 17-pin DLC. The MECS adapter cable kit is optional and must be purchased separately. Use the following diagrams to connect the adapter cable.

6-Pin MECS


Cable Adapter
6-Pin MECS
P/N CP9131
Vehicle DLC
6-Pin MECS
To Scan Tool
Pigtail
1 2 3
4 5 6
STI Pigtail
Clip to good vehicle ground

17-Pin MECS


Adapter Cable
6-Pin MECS
P/N CP9131
Vehicle DLC
17-Pin MECS
To
Scan Tool
STI Pigtail
4
5
6
1
2
3
STO
Clip to good
vehicle ground

MECS Ford Probe

IMPORTANT

Certain Ford Probes have a WHITE TACH CONNECTOR located very close to the 6-pin self-test connector and bundled in the same wiring harness. This is not the self-test input (STI) pigtail.

Connect the pigtail to the **BLACK STI** connector located farther back on the wire harness. If the tool is connected to the **WHITE** tach connector, serious damage may result and may void warranty. Refer to the illustration.

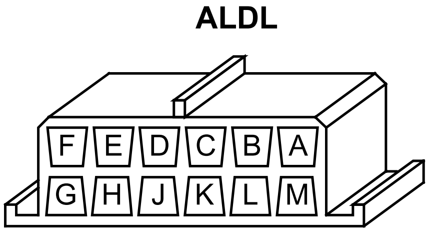
GM Historic

Prior to1996, most GM vehicles used the 12-pin Assembly Line Diagnostic Link (ALDL) DLC. The GM ALDL cable kit includes the ALDL adapter and cigarette lighter power cable. This adapter cable is included with the Scan Tool. In 1994 and 1995, certain GM vehicles used the J1962 (OBD II) DLC, but are not OBD II compliant. Refer to **Appendix B - Data Link Connectors**.

IMPORTANT **Use the cigarette lighter cable to provide 12V to the tool.**

The ALDL DLCs are usually located under the dashboard on the driver's side.

On Corvettes and Fieros, the DLC may be located in the center console behind the ashtray. Refer to service manual for exact location. It may be in full view, or it may be recessed behind a panel. An opening in the panel should allow access to the recessed connector.



Chrysler Historic

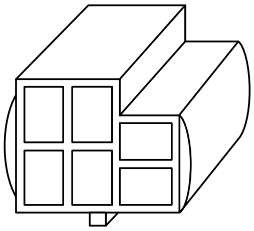
Prior to 1996, most Chrysler vehicles used either the serial communications interface (SCI) or LH DLC. Refer to **Appendix B - Data Link Connectors** for DLC type and location. The SCI adapter cable is included with the Scan Tool. The LH adapter cable (CP9130) can be purchased from your dealer.

IMPORTANT **Use the cigarette lighter cable to provide 12V to the tool when using the SCI adapter cable.**

Serial Communications Interface SCI

The SCI (serial communications interface) DLC is a 6-pin connector located in the engine compartment. The adapter cable to be used on these vehicles is supplied with the tool. This cable is labeled CHRY on the 15-pin DB style connector and SCI on the vehicle end.

SCI

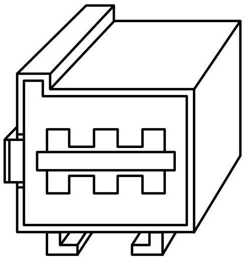


LH

This DLC is used on LH platform vehicles. The LH style DLC is a small, blue, rectangular 6-pin connector located in the passenger compartment below the dashboard to the right of the steering column.

The LH Adapter Cable (CP9130) is optional and must be purchased separately.

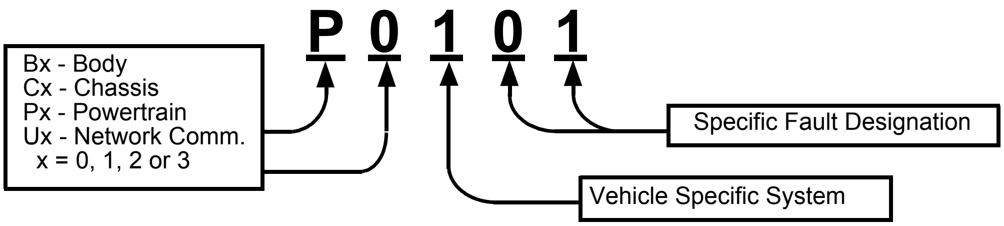
LH (P/N CP9130)



OBD II Diagnostic Trouble Codes (DTCs)

✓ DTCs are used to help determine the cause of a problem or problems with a vehicle.

- ❒ DTCs consist of a five-digit alphanumeric code.
- ❒ The DTCs format and general code types are shown bel


P 0 1 0 1
Bx - Body
Cx - Chassis
Px - Powertrain
Ux - Network Comm.
x = 0, 1, 2 or 3
Specific Fault Designation
Vehicle Specific System

Example:
P0101 - Mass or Volume Air Flow Circuit Range/Performance Problem

Powertrain Codes
P0xxx *- Generic (SAE)*
P1xxx *- Manufacturer Specific*
P2xxx *- Generic (SAE)*
P30xx-P33xx *- Manufacturer Specific*
P34xx-P39xx *- Generic (SAE)*

Chassis Codes
C0xxx *- Generic (SAE)*
C1xxx *- Manufacturer Specific*
C2xxx *- Manufacturer Specific*
C3xxx *- Generic (SAE)*

Body Codes
B0xxx *- Generic (SAE)*
B1xxx *- Manufacturer Specific*
B2xxx *- Manufacturer Specific*
B3xxx *- Generic (SAE)*

Network Communication Codes
U0xxx *- Generic (SAE)*
U1xxx *- Manufacturer Specific*
U2xxx *- Manufacturer Specific*
U3xxx *- Generic (SAE)*

Within each category (Powertrain, Chassis, Body and Network) of DTCs there are assigned ranges for different vehicle systems.

Lower	Upper	Assigned DTC System
P0000	P00FF	Fuel Air Metering Auxiliary Emission Controls
P0100	P02FF	Fuel Air Metering
P0300	P03FF	Ignition System or Misfire
P0400	P04FF	Auxiliary Emission Controls
P0500	P05FF	Vehicle Speed Idle Control Auxiliary Inputs
P0600	P06FF	Computer and Auxiliary Outputs
P0700	P09FF	Transmission
P0A00	P0AFF	Hybrid Propulsion
P1000	P10FF	Manufacturer Control Fuel & Air Metering, Auxiliary Emission Controls
P1100	P12FF	Manufacturer Control Fuel & Air Metering
P1300	P13FF	Manufacturer Control Ignition System or Misfire
P1400	P14FF	Manufacturer Control Auxiliary emission Controls
P1500	P15FF	Manufacturer Cntrl Veh.Spd. Idle Speed Control Auxiliary Inputs

Lower	Upper	Assigned DTC System
P1600	P16FF	Manufacturer Control Auxiliary Inputs Auxiliary Outputs
P1700	P19FF	Manufacturer Control Transmission
P2000	P22FF	Fuel Air Metering Auxiliary emission Controls
P2300	P23FF	Ignition System or Misfire
P2400	P24FF	Auxiliary Emission Controls
P2500	P25FF	Auxiliary Inputs
P2600	P26FF	Computer and Auxiliary Outputs
P2700	P27FF	Transmission
P2900	P32FF	Fuel Air Metering Auxiliary Emission Controls
P3300	P33FF	Ignition System
P3400	P34FF	Cylinder Deactivation
U0000	U00FF	Network Electrical
U0100	U02FF	Network Communication
U0300	U03FF	Network Software
U0400	U04FF	Network Data

✓ J2012 and ISO 15031-6 are standards for all DTCs, established by the SAE, International Organization for Standardization (ISO) and other governing bodies.

  ❐ Codes and definitions assigned by these specifications are known as Generic OBD II codes.

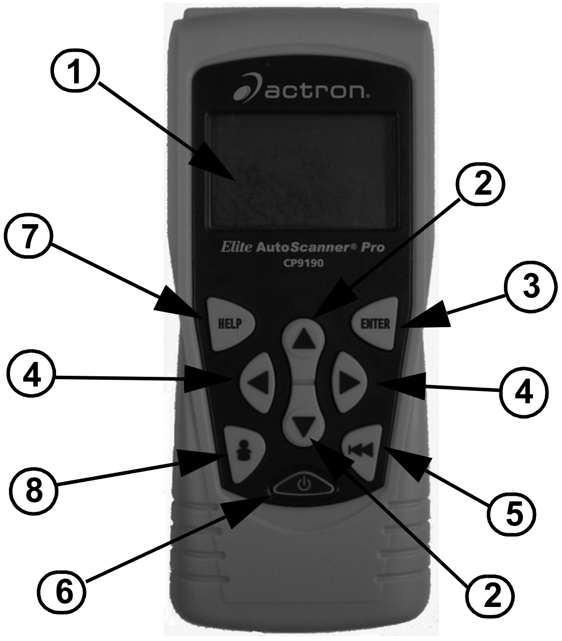
  ❐ OBD II requires compliance to these standards for all cars, light trucks, APVs, MPVs, and SUVs sold in the United States.

  ❐ Codes not reserved by the SAE are reserved for the manufacturer and referred to as Manufacturer Specific Codes.

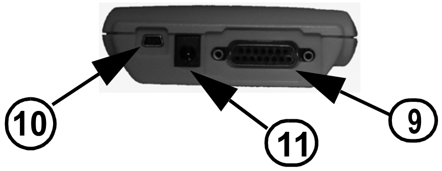
Section 3 – Using The Scan Tool

The Scan Tool

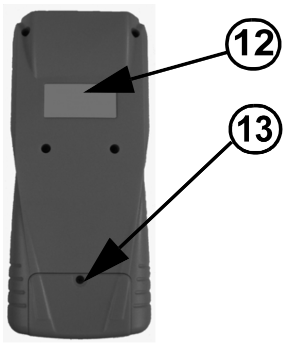
① **LCD Display** – backlit, 128 x 64 pixel display with contrast adjustment.
② ▲ **UP** and ▼ **DOWN** arrow keys – moves selection UP or DOWN.
③ ENTER **ENTER** key – selects displayed items.
④ ◀ **LEFT** and ▶ **RIGHT** arrow keys – selects YES or NO, and selects data parameters for custom data list.
⑤ ⏮ **BACK** key – goes to the previous screen or level.
⑥ ⏻ **ON/OFF** key – turns power ON or OFF.
⑦ HELP **HELP** key – accesses the Help Function.
⑧ **USER** key - allows the operator to access a feature from the Diagnostic Menu with a touch of a key.
⑨ **DLC Cable** – provides connection for vehicle interface.
⑩ **USB Port** – provides a USB connection for the computer.
⑪ **12V Power Jack**– provides power to the Scan Tool when reprogramming from a personal computer, communicating with Ford, GM and Chrysler Historic vehicles, or off-vehicle reviewing of codes and printing.
⑫ **Serial Number Plate** – provides serial number of Scan Tool.
⑬ **Battery Compartment** – provides power to the Scan Tool when reprogramming from a personal computer or off-vehicle reviewing of codes and printing.



Top of Scan Tool



Back of Scan Tool



Specifications

Display: Backlit, 128 x 64 pixel display with contrast adjust
Operating Temperature: 0 to 50°C (32 to 122°F)
Storage Temperature: -20 to 70°C (-4 to 158°F)
Internal Power: 9V Battery
External Power: 7 to 16 Volts

✓ A minimum of 8.0 V is required for most control modules to operate properly in a vehicle.

Power Dissipation: 5 Watts maximum.

Dimensions:	**Height**	**Width**	**Length**
	1.25"	3.875"	9.125"
	31.75 mm	98.4 mm	231.8 mm

Accessories for the Scan Tool

Table 1: Scan Tool Accessories

Part	Part Description	CP9185	CP9190
CD	The CD contains the Manual in English, French and Spanish. The CD also includes a DTC lookup program for looking up DTCs, and language applications for reprogramming the Scan Tool in Spanish and French.	Included	Included
USB Cable	Used to print and upgrade software depending on tool.	Included	Included
OBD II Cable	Communicate between the vehicle and tool. Also supplies power to the tool.	Included	Included
Carry Case	Place to store the Scan Tool when tool is not in use.	Soft Case	Hard Case
Warranty & Registration Card	Provides you with the ability to keep up to date with the newest updates and technology available.	Included	Included
GM Historic Cable	Used to communicate with all GM vehicles using a 12-pin DLC.	Optional	Included
Ford EEC-IV/MCU Cable	Used to communicate with all Ford vehicles that use the large 6-sided connector.	Optional	Included
Chrysler SCI Cable	Used to communicate with all Chrysler vehicles using the L-shaped 6-pin connector located in the engine compartment.	Optional	Included
Extension Cable	Used to attach the GM Historic cable, Ford EEC- IV/MCU cable or Chrysler SCI cable to the Scan Tool.	Included	Included
Cigarette Lighter Cable	Provides power to the Scan Tool for vehicles that require the Ford EEC-IV/MCU cable, GM Historic cable or Chrysler SCI cable.	Optional	Included

✓ **Replacement Parts** are available from the manufacturer by contacting customer service.

- Phone at **1-800-228-7667** (8:00 - 6:00 EST Monday - Friday).

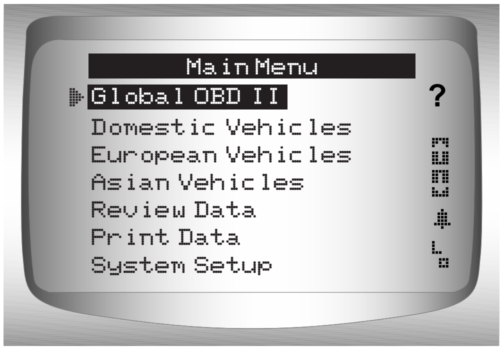
Display

The display has a large viewing area displaying messages, instructions, and diagnostic information.

✓ The back-lit liquid crystal display (LCD) is a 128 x 64 pixel display.

☐ Characters used to help operate the Scan Tool are:

- ▶ Indicates cursor location.
- ▣ Indicates information is available for an item or multiple items.
- ? Indicates when Help is available.
- ⁞ Indicates additional information is available on previous screen by using the ▲ **UP** arrow key.
- ⁞ Indicates additional information is available on next screen by using the ▼ **DOWN** arrow key.
- ⌞ Indicates internal batteries need replaced or are not installed.
- ♪ Indicates beeper is enabled.
- ▦ Indicates graphical viewing available.



Main Menu
▶ Global OBD II
Domestic Vehicles
European Vehicles
Asian Vehicles
Review Data
Print Data
System Setup

Keypad

The keypad is used to move through the different menus of the Scan Tool. The Scan Tool's software is designed for ease in operating and navigating through menus.

⚠CAUTION Do not use solvents such as alcohol to clean keypad or display. Use a mild nonabrasive detergent and a soft cotton cloth.

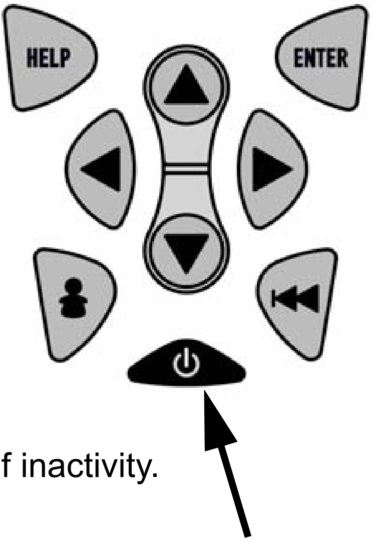
⚠CAUTION Do not soak keypad as water might find its way inside the Scan Tool.

Power

✓ Refer to **Scan Tool Does Not Power Up** in section 9 **Troubleshooting** on page 9-2 if there are problems.

✓ ⏻ **ON/OFF** button on Scan Tool turns tool on and off.

- ❒ Press and hold ⏻ **ON/OFF** key for at least 1 second to turn on Scan Tool.

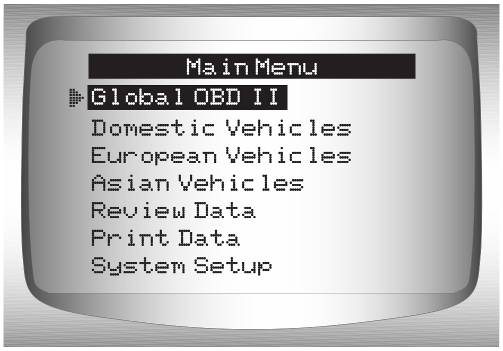


Internal Battery

✓ When powered from the internal battery, the Scan Tool disables the display's backlighting and turns OFF after a period of inactivity.

✓ Each time the Scan Tool is powered up, voltage of the internal battery is checked.

- ☐ If voltage is low, the Low Battery Symbol (🔋) displays on screen.
- ☐ Replace the battery using instructions provided in Battery Replacement.

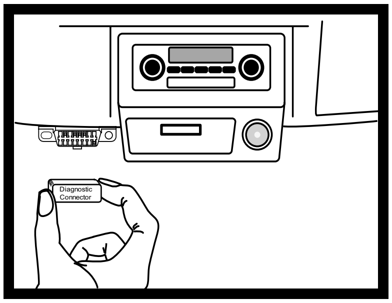


Main Menu
Global OBD II
Domestic Vehicles
European Vehicles
Asian Vehicles
Review Data
Print Data
System Setup

⚠CAUTION If the Scan Tool will not be used for an extended period of time, remove the battery to prevent battery leakage from damaging the battery compartment.

Vehicle Power

When using the OBD II Cable, the power to the Scan Tool comes from the vehicle DLC.

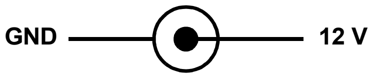


Some vehicle cigarette lighters are not powered when the ignition is in the OFF position. Therefore, you may wish to use battery clip adapters.

AC Power Adapter

An AC power adapter (not included) can be used to power the Scan Tool when reprogramming from a personal computer or for off-vehicle reviewing of codes and printing.12V AC-DC converters are available at most PC and electronic stores.

✓ The Scan Tool is equipped to accept any 110 VAC - 12 VDC wall adapter with the following specifications:



❒ 500 mA minimum current unregulated wall power adapter
❒ 5.5 mm outside diameter
❒ 2.5 mm inside diameter
❒ The inside tip is positive (+)

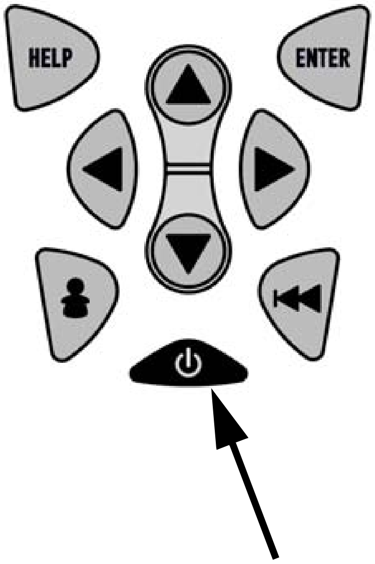
Scan Tool Power UP

1. Connect Power Source

- Internal Battery (9V Battery), or vehicle Power DLC
- AC Adapter, or cigarette lighter cable.

2. Press and Hold ⏻ ON/OFF **key**

- For 1 second until the Scan Tool turns on.



System Setup

✓ ***System Setup*** allows:

❒ Measurement units to be changed.
❒ Display contrast to be changed.
❒ Auto-Power off time to be changed.
❒ Scan Tool information to be viewed.
❒ Display to be checked.
❒ Operation of the keypad to be checked.
❒ Memory of the tool to be checked.
❒ Scan Tool to be upgraded, or programmed for a different language.

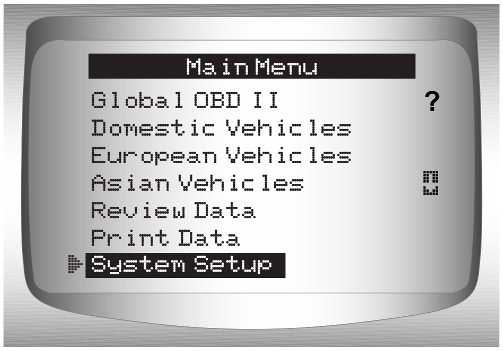
✓ ***System Setup*** settings remain until internal battery becomes discharged or is removed.

From ***Main Menu***:

1.Select *System Setup.*

•Use ▲ **UP** or ▼ **DOWN** arrow key until ***System Setup*** is highlighted.

•Press **ENTER**.


Main Menu
Global OBD II
?
Domestic Vehicles
European Vehicles
Asian Vehicles
Review Data
Print Data
System Setup

Changing Measurement Units

✓ English is the default measurement unit.

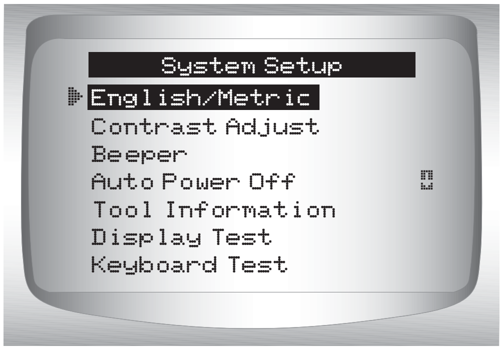
✓ Measurement units can be changed in View and Record Data.

From ***System Setup*** screen:

1.Select *English/Metric.*

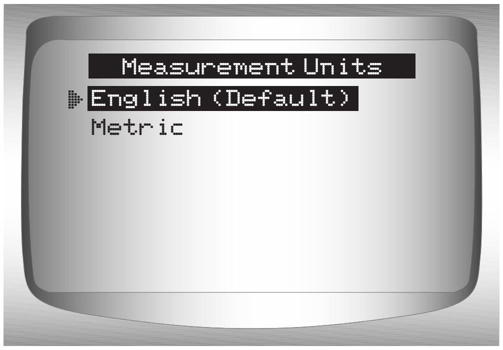
•Use ▲ **UP** or ▼ **DOWN** arrow key until ***English/Metric*** is highlighted.

•Press **ENTER**.


System Setup
English/Metric
Contrast Adjust
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test

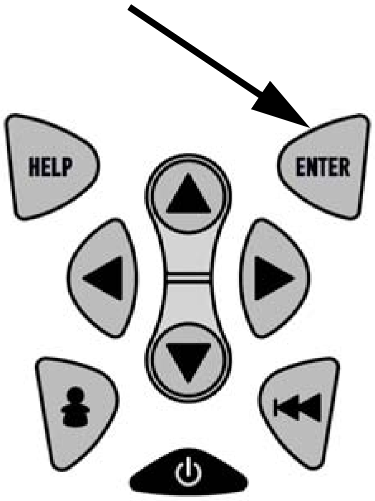
2.Select Desired Measurement Unit.

- Use **UP** or **DOWN** arrow key until desired unit is highlighted.


Measurement Units
English (Default)
Metric

3.Save Measurement Setting.

- Press **ENTER**.



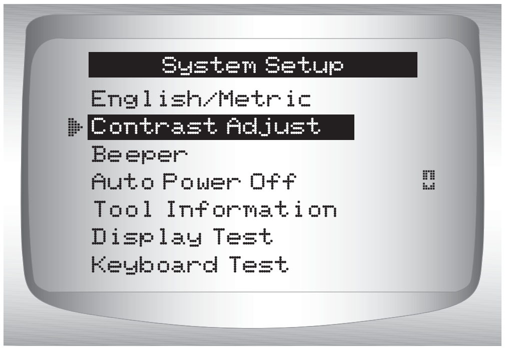
✓ Press **ENTER** again to return to the ***System Setup*** menu.

Changing Display Contrast

From ***System Setup*** screen:

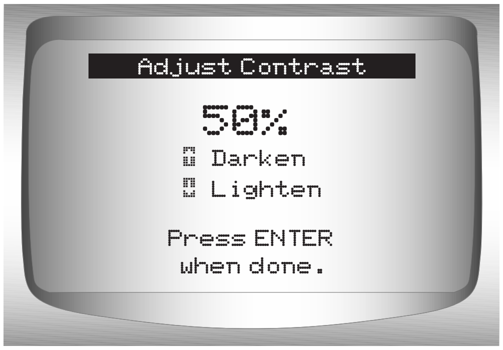
1.Select *Contrast Adjust.*

- Use **UP** or **DOWN** arrow key until ***Display Contrast*** is highlighted.
- Press **ENTER**.


System Setup
English/Metric
Contrast Adjust
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test

2.Increase or Decrease Display Contrast.

- Use ▲ **UP** arrow key to increase Contrast.
- Use ▼ **DOWN** arrow key to decrease Contrast.



Adjust Contrast

50%

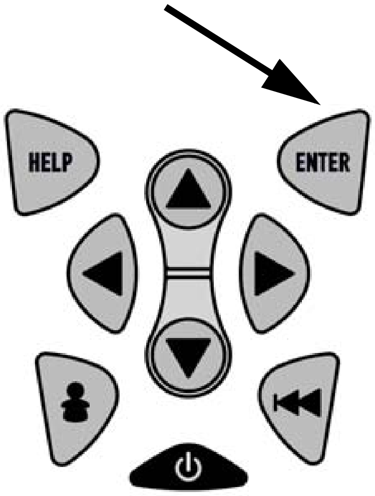
▲ Darken

▼ Lighten

Press ENTER
when done.

3.Save Contrast Setting and return to the ***System Setup*** menu.

- Press **ENTER**.



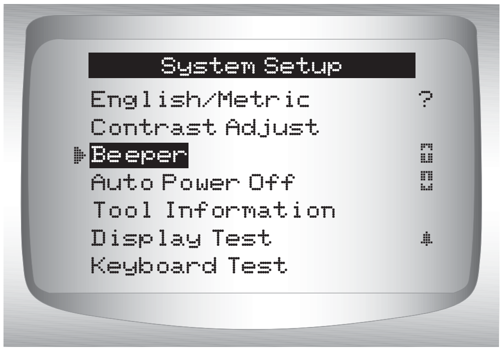
Beeper

✓ Beeper selection allows the user to turn off the Scan Tool's beeper. The bell symbol 🔔 will not appear in the lower right hand corner of the display when the beeper is off.

From ***System Setup*** menu:

1.Select *Beeper.*

- Use **UP** or **DOWN** arrow key until ***Beeper*** is highlighted.
- Press **ENTER**.



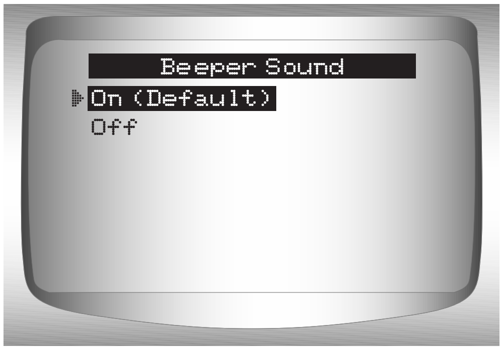
System Setup
English/Metric ?
Contrast Adjust
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test

2.Select desired Beeper sound choice.

- Use **UP** or **DOWN** arrow key until desired choice is highlighted.

3.Save Beeper sound setting.

- Press **ENTER**.



Beeper Sound
On (Default)
Off

✓ Press **ENTER** again to return to the ***System Setup*** menu.

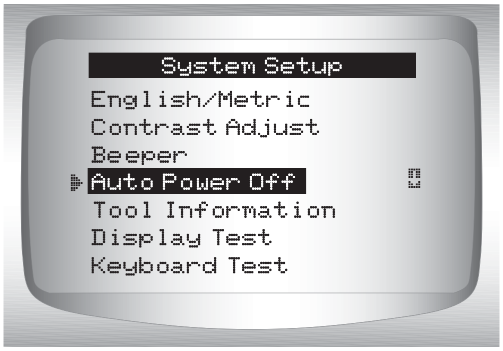
Changing Auto-Power Off

The Auto-Power Off feature allows the tool to turn off automatically after a selected amount of time when tool is not being used.

From ***System Setup*** menu:

1.Select *Auto Power Off.*

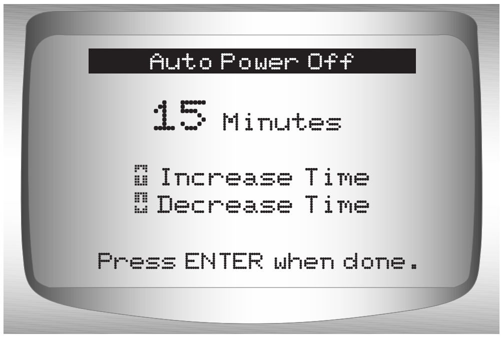
- Use **UP** or **DOWN** arrow key until ***Auto Power Off*** is highlighted.
- Press **ENTER**.



System Setup
English/Metric
Contrast Adjust
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test

2.Increase or Decrease *Auto Power Off* Time.

- Use UP arrow key to increase Time.
- Use DOWN arrow key to decrease Time.



Auto Power Off

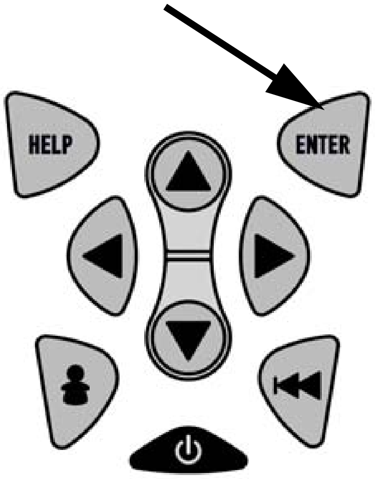
15 Minutes

Increase Time
Decrease Time

Press ENTER when done.

3.Save *Auto Power Off* Time.

- Press **ENTER**.



✓ Press **ENTER** again to return to the ***System Setup*** menu.

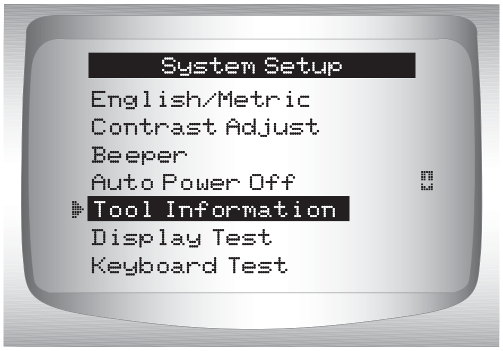
View Tool Information

✓ This function allows you to view specific tool information that may be needed when contacting customer service.

From ***System Setup*** menu:

1.Select *Tool Information.*

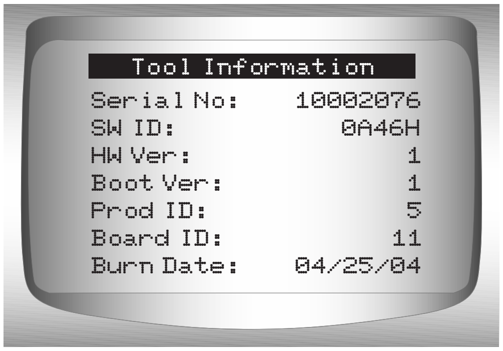
- Use UP or DOWN arrow key until ***Tool Information*** is highlighted.
- Press **ENTER**.



System Setup
English/Metric
Contrast Adjust
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test

2.View Information:

- ❒ Serial Number (Serial No:)
- ❒ Software ID (SW ID:)
- ❒ Hardware Version (HW Ver:)
- ❒ Boot Version (Boot Ver:)
- ❒ Product ID (Prod ID:)
- ❒ Board ID (Board ID:)
- ❒ Burn Date (Burn Date:)
- ❒ Burn Location (Burn Loc:)



```
    Tool Information
Serial No:    10002076
SW ID:           0A46H
HW Ver:              1
Boot Ver:            1
Prod ID:             5
Board ID:           11
Burn Date:    04/25/04
```

3.Write Down Scan Tool Information.

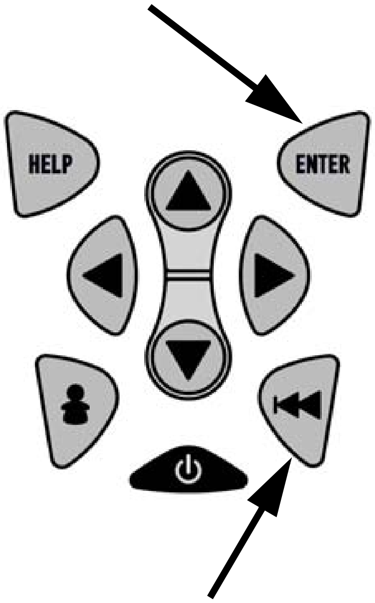
- Space is provided on inside front cover to record the Scan Tool information.

4.Return to *Setup Tool* Menu.

•Use the ⏮ **BACK** key.

OR

•Use the **ENTER** Key.



Display Test

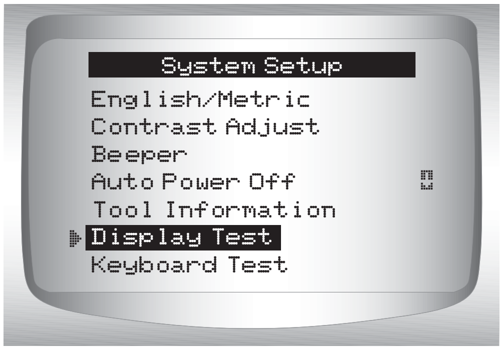
The ***Display Test*** is used to check the display.

✓ The test fills every pixel of the display with a solid black character.

From ***System Setup*** menu:

1.Select *Display Test.*

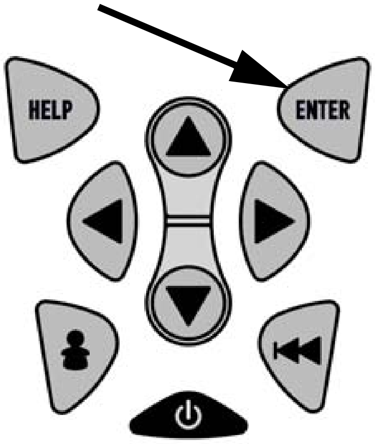
•Use ▲ **UP** or ▼ **DOWN** arrow key until ***Display Test*** is highlighted.



```
    System Setup
 English/Metric
 Contrast Adjust
 Beeper
 Auto Power Off
 Tool Information
▸Display Test
 Keyboard Test
```

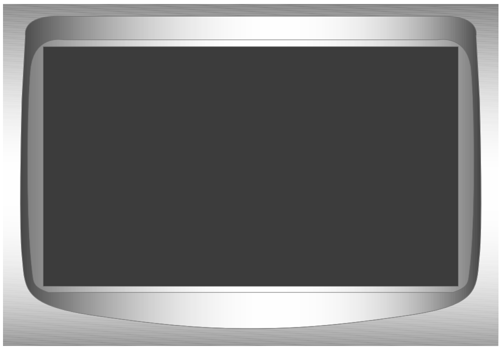
2. Start *Display Test.*

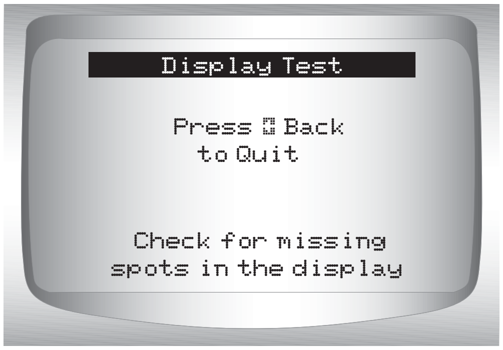
•Press ENTER.



3. Look for Missing Spots.

- All characters display in solid black if there are no concerns.
- Screen flips back and forth between screens shown below.



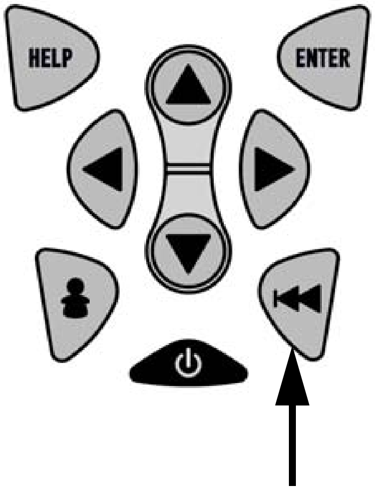


Display Test

Press ⏮ Back
to Quit

Check for missing
spots in the display

4. When Done, Press BACK Key.

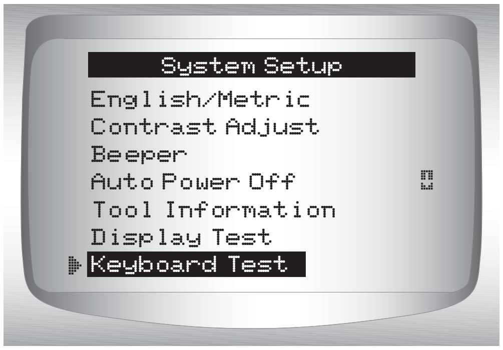


Keyboard Test

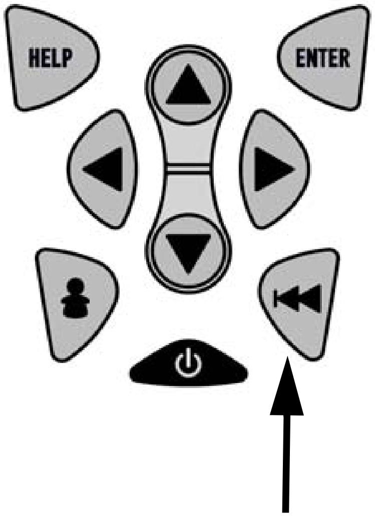
The ***Keyboard Test*** is used to verify keys are working correctly.

From ***System Setup*** menu:

1. **Select *Keyboard Test.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Keyboard Test*** is highlighted.
   - •Press **ENTER**.


System Setup
English/Metric
Contrast Adjust
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test

2. **Press a KEY**.
   - Key name or scroll direction should inverse colors on display.
   - The only exception is the **BACK** key. When **BACK** key is pressed, ***System Setup*** menu returns.



✓ If ***System Setup*** menu does not return, then **BACK** key is not working correctly.

Memory Test

✓ The ***Memory Test*** will test RAM and Flash ROM.

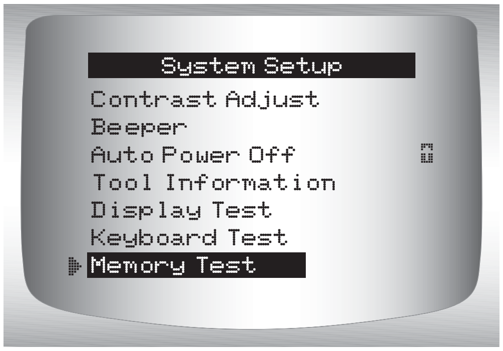
✓ Run the ***Memory Test*** if the tool has trouble:

- ❒ Playing back recorded data.
- ❒ Displaying trouble code definitions.
- ❒ Doing any function that uses internal memory.

From ***System Setup*** menu:

1.Select *Memory Test.*

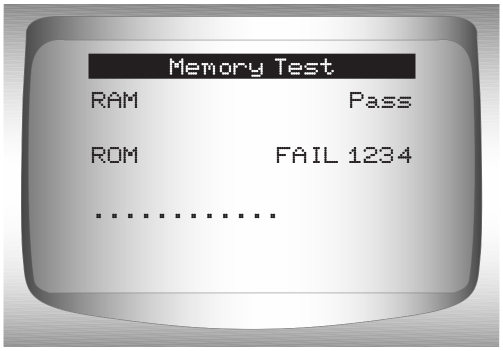
- •Use ⏶ UP or ⏷ **DOWN** arrow key until ***Memory Test*** is highlighted.
- •Press **ENTER**.



System Setup

Contrast Adjust
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test
Memory Test

✓ Dots along the bottom of the screen show progress of the Memory Test.



Memory Test

RAM Pass

ROM FAIL 1234

....

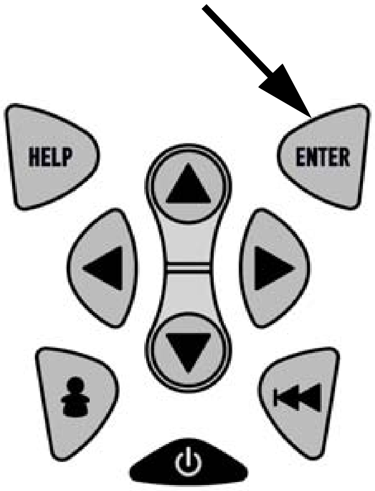
❒ ***Memory Test*** may take several minutes to complete.

❒ ***Memory Test*** results display.

- ❒ If no problems were detected, then PASS is displayed
- ❒ If RAM fails, an error message is shown.
- ❒ If ROM fails, a checksum is shown.

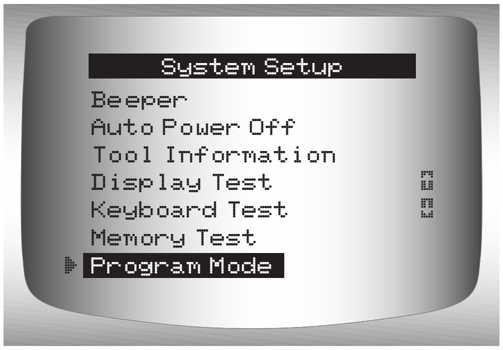
2. Return to *System Setup* menu.

- •Press **ENTER**.



Program Mode

The ***Program Mode*** is used for reprogramming the Scan Tool with English, Spanish or French languages. The Scan Tool is programmed with English by default.


System Setup
Beeper
Auto Power Off
Tool Information
Display Test
Keyboard Test
Memory Test
Program Mode

The Program Mode is also used for updating the Scan Tool. Instructions are provided with upgrades.

Connecting The Scan Tool

To diagnose a vehicle, connect the DLC and power adapter (if applicable) to the Scan Tool. Refer to **“Data Link Connector (DLC)”** on page 2-9 of **Getting Started.**

If you just want to power up the tool to do self-tests, code lookup, review or printing data from the last vehicle tested, then you do not need to attach the cable to the DLC. The internal battery provides power for this.

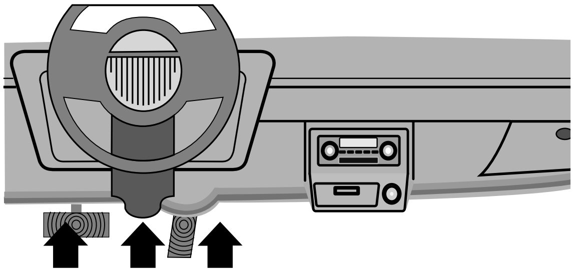
1.Connect appropriate cable to Scan Tool

•Make sure pins are not bent.

✓ Depending on vehicle, either the OBD II Cable or Extension Cable is required.

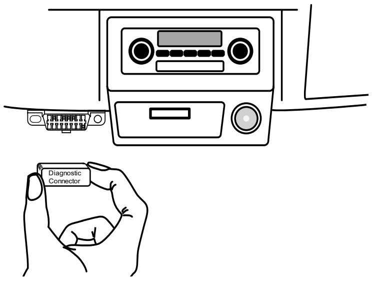
2.Find DLC on vehicle.

- For OBD II vehicles, look under the dashboard on the driver's side of the vehicle.
- If the DLC is not located under the dashboard, a label should be there telling the location.



For GM, Ford, and Chrysler Historic vehicles refer to **"Appendix B - Data Link Connectors"*.***

3.Remove DLC cover if required.


Diagnostic Connector

4.Connect cable to vehicle.

- Make sure pins are not bent.

✓ Use the appropriate vehicle cable for vehicles that require the extension cable.

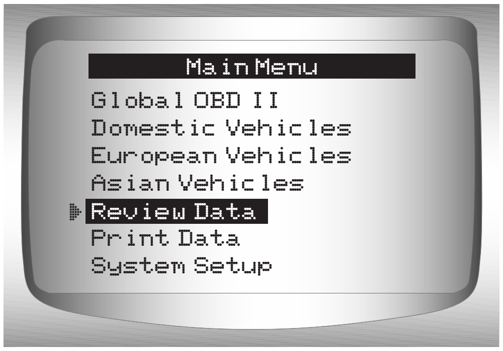
Review Data

✓ The ***Review Data*** function allows the user to view the information from the previous vehicle tested.

✓ Scan Tool does not require power from the vehicle to use the ***Review Data*** function.

1. Select *Review Data.*

- Use ▲ **UP** or ▼ **DOWN** arrow key until ***Review Data*** is highlighted.
- Press **ENTER**.


Main Menu
Global OBD II
Domestic Vehicles
European Vehicles
Asian Vehicles
Review Data
Print Data
System Setup

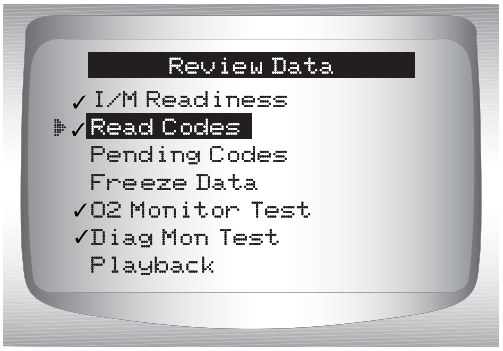
✓ Scan Tool ***Review Data*** function has different types of data to review depending on vehicle selected.

Refer to appropriate section of this manual for what functions have data for review.

2.Follow prompts and instructions provided by Scan Tool.

✓ The ***Review Data*** menu shows a checkmark next to the item(s) that has data.

✓ If data does not exist for function selected to review, a message informs the user to run a function first.


Review Data
✓ I/M Readiness
✓ Read Codes
Pending Codes
Freeze Data
✓ O2 Monitor Test
✓ Diag Mon Test
Playback

✓ Only 1 function, ***Playback***, needs detailed instructions.

Playback

The ***Playback*** function is used to playback a recording.

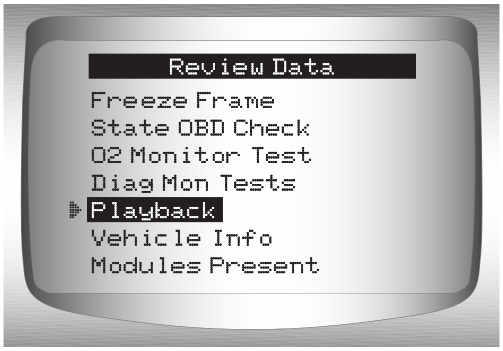
✓ This function is very similar to ***View Data***. The only difference is that ***View Data*** is real time viewing of PIDs, while ***Playback*** is a viewing of previously recorded PIDs.

From the ***Review Data*** menu:

1.Select *Playback.*

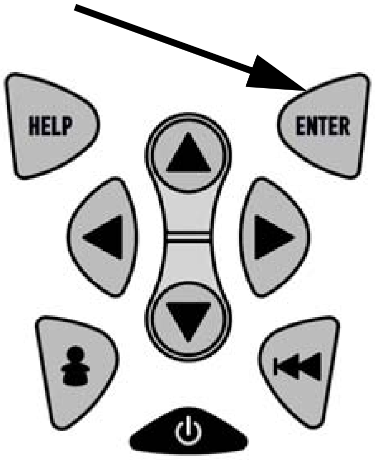
- Use ▲ **UP** or ▼ **DOWN** arrow key until ***Playback*** is highlighted.

✓ Scan Tool displays a NO RECORDING PRESENT message if recording does not exist.


Review Data
Freeze Frame
State OBD Check
O2 Monitor Test
Diag Mon Tests
Playback
Vehicle Info
Modules Present

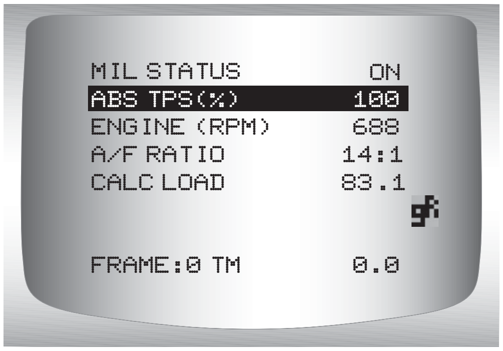
2. Play Back Recording.

- Press **ENTER.**



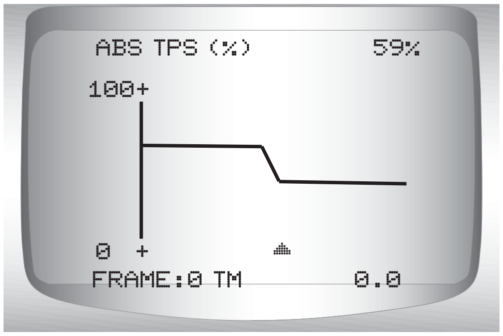
✓ On GM Historic and Ford Historic vehicles, you must select the data to playback as an **Entire Data List** or **Custom Data List**.

✓ The ***Playback*** has frame number and timestamp (in seconds).



```
MIL STATUS          ON
ABS TPS(%)         100
ENGINE (RPM)       688
A/F RATIO         14:1
CALC LOAD         83.1

FRAME:0 TM         0.0
```

- ☐ Negative frames and timestamps indicate data recorded before trigger event.
- ☐ Positive frames and timestamps indicate data recorded after trigger event.
- ☐ Use ▲ **UP** or ▼ **DOWN** arrow keys to view recorded PID data of each frame.
- ☐ Use ◀ **LEFT** or ▶ **RIGHT** arrow keys to scroll back and forth through frames.
- ☐ If graphing is available for selected PID, the “ 📈 ”, icon is located on the side of the screen.
  - – Press **ENTER** to view graph.
  - – Press **ENTER** again to return to ***Playback***.



```
ABS TPS (%)          59%
100+

0  +
FRAME:0 TM           0.0
```

Note: Graphing is only available on 1996 and newer vehicles equipped with an OBD II (J1962) connector.

✓ The triangle below the graph indicates the position of the frame in the graph.

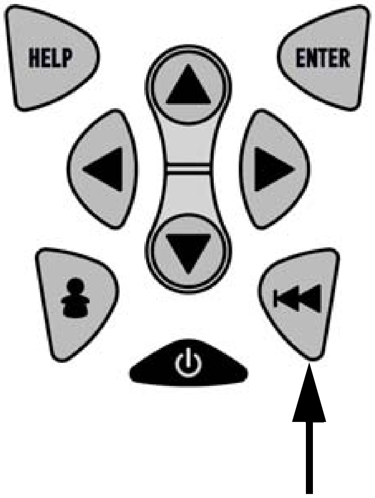
- ☐ Use ◀ **LEFT** or ▶ **RIGHT** arrow keys to scroll back and forth through graph.

✓ Different vehicles communicate at different speeds and support a different number of PIDs. Therefore, the maximum number of frames that can be recorded varies.

✓ Some vehicles wait a long period of time to store a DTC after a driveability problem occurs. If the operator selected Trigger On Codes when making a recording, the operator might not see any drastic change in data parameters before and after trigger point.

3.Return to *Review Data* menu***.***

•Press ⏮ **BACK.**



Print Data

The **Print Data** function allows the printing of diagnostic information stored in the Scan Tool.

✓ Scan Tool **Print Data** function has different types of data to print, depending on vehicle selected. Refer to appropriate section of this manual for what functions have data to print.

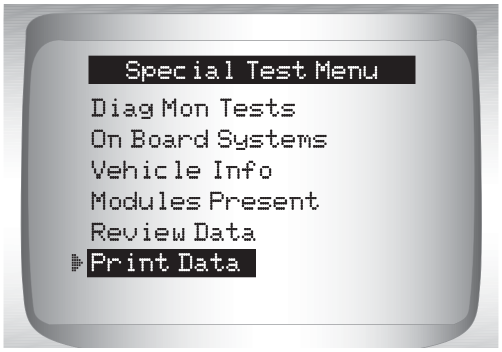
✓ The Scan Tool’s internal battery power can be used to print data.

✓ Make sure you have previously installed the PC software in Using the CD.

✓ Launch Scanning Suite and then start printing application.

✓ Follow all instructions on PC.

From ***Special Tests*** menu:


Special Test Menu
Diag Mon Tests
On Board Systems
Vehicle Info
Modules Present
Review Data
Print Data

1. Select *Print Data.*

- Use ▲ **UP** or ▼ **DOWN** arrow key until ***Print Data*** is highlighted.
- Press **ENTER**.

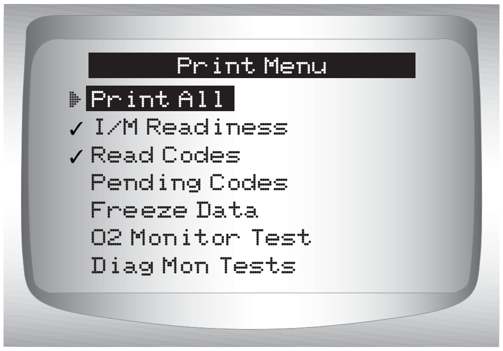
✓ On the ***Print Menu***, **Print All** prints all data collected by the Scan Tool.

✓ When printing playback data, Start Frame and End Frame need to be defined.

2. Select Data To Be Printed.

- Use ▲ **UP** or ▼ **DOWN** arrow key.
- Press **ENTER**.

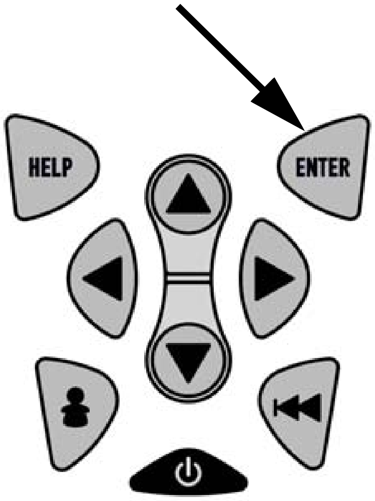
✓ The ***Print Menu*** shows a check mark next to the item(s) that has data.


Print Menu
Print All
✓ I/M Readiness
✓ Read Codes
Pending Codes
Freeze Data
O2 Monitor Test
Diag Mon Tests

✓ When selected data does not exist in the Scan Tool's memory, a message informs the user to run the function.

3. Return to *Select Print Data* screen.

- Press ENTER **ENTER.**



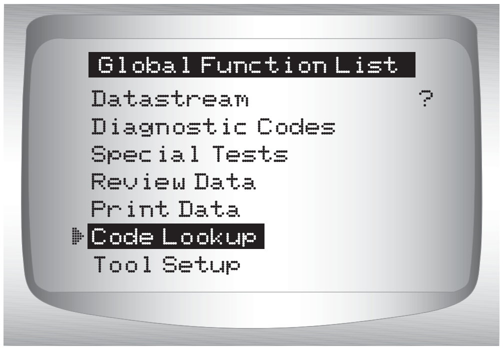
Code Lookup

Code Lookup is used to look up definitions of DTCs stored in the Scan Tool.

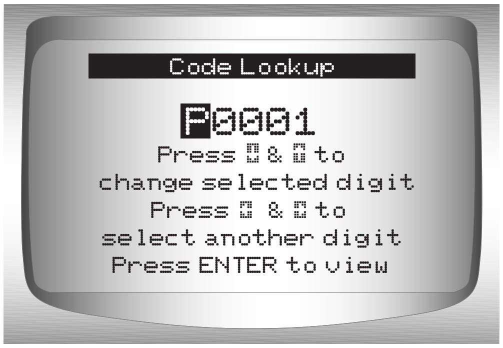
✓ The Scan Tool does not require power from the vehicle to perform this function.

1. Select *Code Lookup.*

- Use ▲ **UP** or ▼ **DOWN** arrow key until ***Code Lookup*** is highlighted.
- Press ENTER **ENTER**.



Global Function List
Datastream ?
Diagnostic Codes
Special Tests
Review Data
Print Data
Code Lookup
Tool Setup



Code Lookup

P0001

Press ▯ & ▯ to
change selected digit
Press ▯ & ▯ to
select another digit
Press ENTER to view

2.Enter code.

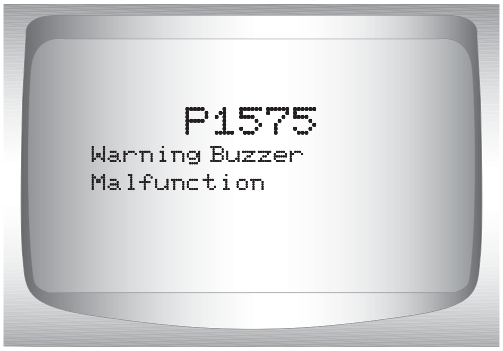
- All characters must be entered
- Only one character can be changed at a time.
- Use ◀ **LEFT** or ▶ **RIGHT** arrow keys to scroll to desired character.
- Use ▲ **UP** or ▼ **DOWN** arrow keys to change selected character.
- Press **ENTER**.

✓ On GM Historic, Ford Historic and Chrysler vehicles the MIL (Blinky) code may also be entered.

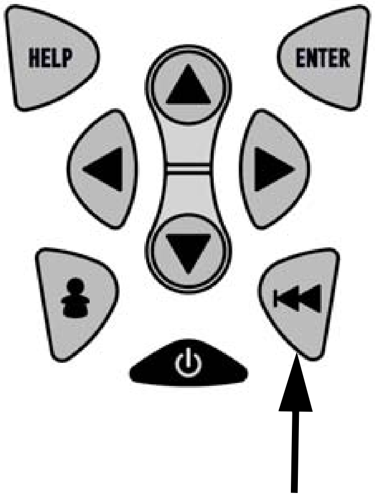
✓ Chrysler and GM vehicles may have an additional screen asking in which system to look for a code.

✓ If definition could not be found (SAE or Enhanced), the Scan Tool displays No DTC Definition Found. See Service Manual. If the DTC is manufacturer specific the DTC is assigned to display. Refer to the vehicle service manual for exact definition.

- ✓ To View Previous or Next DTC use ▲ **UP** or ▼ **DOWN** arrow key.


P1575
Warning Buzzer
Malfunction

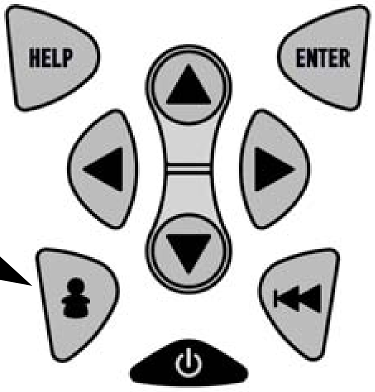
- ✓ To enter another DTC, press ⏮ **BACK**.



- ✓ Press ⏮ **BACK** again to return to menu from which **Code Lookup** was selected.

Setup User Key

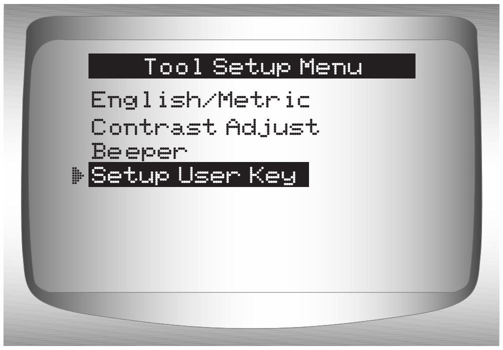
The USER KEY allows the operator to read or erase codes with the touch of a key.



✓ The User Key can only be used when the Scan Tool is in a vehicle specific ***Function List*** or a sub menu.

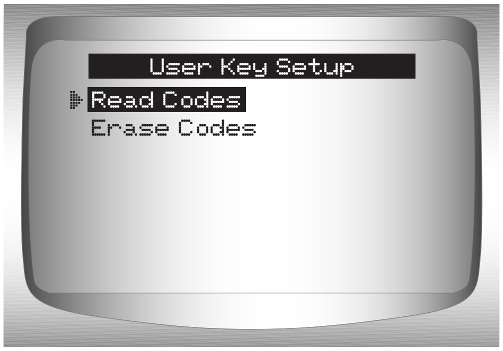
From ***Tool Setup Menu:***

1. **Select *Setup User Key.***
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***Setup User Key*** is highlighted.
   - Press **ENTER**.



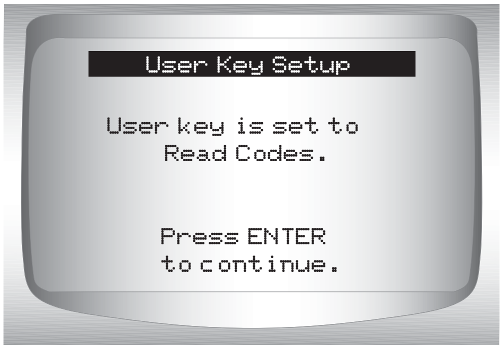
```
Tool Setup Menu
English/Metric
Contrast Adjust
Beeper
Setup User Key
```

2. **Choose desired setting(s).**
   - Use ▲ **UP** or ▼ **DOWN** arrow keys to move up and down list.



```
User Key Setup
Read Codes
Erase Codes
```

3. **Press ENTER key to save settings.**



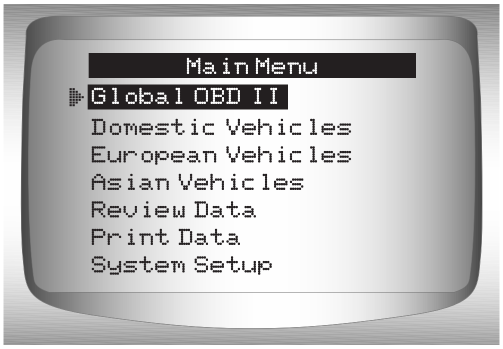
```
User Key Setup

User key is set to
Read Codes.

Press ENTER
to continue.
```

Vehicle Selection

From ***Main Menu:***

1.Select desired vehicle to diagnose.

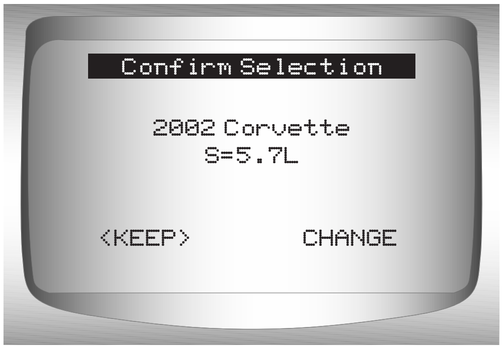
- Use ▲ **UP** or ▼ **DOWN** arrow key to highlight:
  - ☐ Global OBD II
  - ☐ Domestic Vehicles
  - ☐ European Vehicles
  - ☐ Asian Vehicles
- Press **ENTER**.


Main Menu
Global OBD II
Domestic Vehicles
European Vehicles
Asian Vehicles
Review Data
Print Data
System Setup

✓ If vehicle displayed is not the vehicle being diagnosed select ***CHANGE*** and go to step 3.

2.Confirm selection.

- Use ◀ **LEFT** or ▶ **RIGHT** arrow keys.
- Press **ENTER**.


Confirm Selection

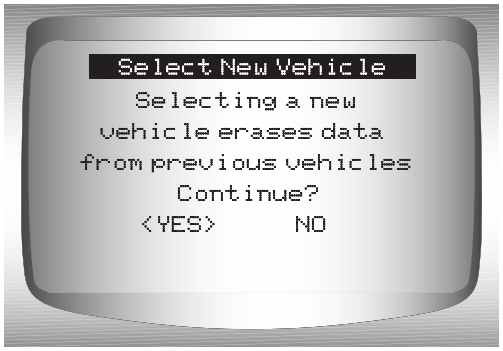
2002 Corvette
S=5.7L

✓ If keeping the selected vehicle select **KEEP** and press **ENTER.** You will then arrive at the appropriate function list for the selected vehicle.

✓ If changing the selected vehicle, select CHANGE and press **ENTER,** then go to step 3.

3. Select erase data stored in the tool from the previous vehicle tested or not.

- Use ◀ **LEFT** or ▶ **RIGHT** arrow key.
- Press **ENTER**.



Select New Vehicle

Selecting a new vehicle erases data from previous vehicles Continue?

<YES> NO

✓ On GM vehicles the tool may require you to look at the VIN to determine the Series, Model, Engine Size and more.

❐ For example a GM Tahoe may be considered a K1500 series.

GM Typical VIN

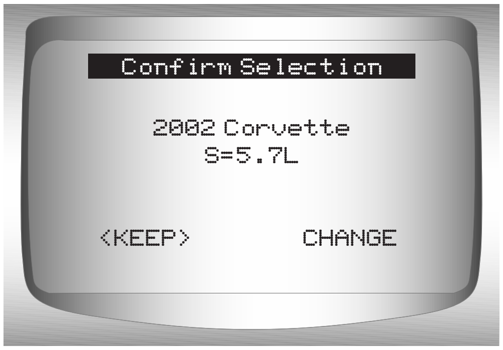
VIN Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Description of Number					Series	Line Chassis	Chassis Type	Engine Type		Model Year							

✓ If Domestic, Asian or European Vehicles is selected, the tool may ask for the following information:

❐ Manufacturer
❐ Car/Truck
❐ Year
❐ Make
❐ Model
❐ Engine
❐ Special Information

4.*Confirm selection*.

- Use ◀ **LEFT** or ▶ **RIGHT** arrow key.
- Press **ENTER**.



Confirm Selection

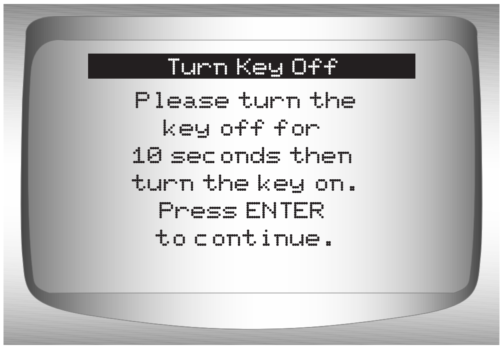
2002 Corvette
S=5.7L

<KEEP> CHANGE

✓ The following screen only displays when power comes from vehicle.

5. Follow Instructions on the display.

- Turn vehicle key off for 10 seconds.
- Turn vehicle key back to the on position.
- Press ENTER **ENTER** on the Scan Tool.



Turn Key Off

Please turn the key off for 10 seconds then turn the key on. Press ENTER to continue.

- ✓ The first time the scan tool links to the vehicle, the communication protocol is automatically detected, and is used until the Scan Tool is turned off or another vehicle is diagnosed.

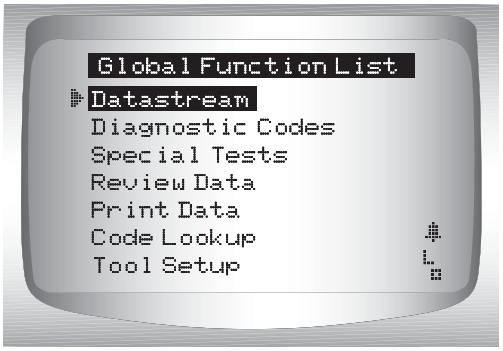
- ✓ If an **Error Message** displays, make sure the OBDII connector is attached, and the ignition key is on. Cycle ignition key to off for 10 seconds, then on. This may be required to reset computer. If required, select yes to try again. If problem still exists, refer to**“Error Messages**” on page 9-2 of **Troubleshooting**.

- ✓ The Scan Tool keeps all data received from the last vehicle selected until any of the following occurs:
  - ❐ A new vehicle is selected.
  - ❐ The internal 9V battery is discharged or has been removed.
  - ❐ Scan Tool is flash programmed to update software, or to change language.
  - ❐ Data from last vehicle tested is erased.

- ✓ On initial link to vehicle, Scan Tool checks the status of **I/M Monitors** no matter which function is selected.

Global Function List

IMPORTANT Items marked with “-” are covered in section 3 of this manual. These items are not covered in this section.


Global Function List
Datastream
Diagnostic Codes
Special Tests
Review Data
Print Data
Code Lookup
Tool Setup

✓ The ***Global Function List*** is broken down into the following menus:

- ☐ **Datastream Menu**
  - ☐ View Data
  - ☐ Record Data
  - – Review Data
  - – Print Data
  - – Tool Setup
- ☐ **Diagnostic Codes Menu**
  - ☐ Read Codes
  - ☐ Pending Codes
  - ☐ Erase Codes
  - ☐ View Freeze Data
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup
- ☐ **Special Tests Menu**
  - ☐ I/M Readiness
  - ☐ Drive Cycle Monitor
  - ☐ State OBD Check
  - ☐ O2 Monitor Test
  - ☐ Diagnostic Monitor Test
  - ☐ On-Board Systems
  - ☐ Vehicle Information
  - ☐ Modules Present
  - – Review Data
  - – Print Data
  - – Tool Setup

(List Continued)

❒ **Review Data**

❒ **Print Data**

- •I/M Readiness
- •State OBD Check
- •DTC (Codes)
- •Pending Codes
- •Freeze Frame
- •O2 Monitor Test
- •Diag Monitor Tests
- •Playback
- •Vehicle Info
- •Modules Present

✓ For Global OBD II Diagnostics, The above functions have data to review or print. For Print/Review instructions, refer to "**Print Data**" or "**Review Data"** on page 3-21 of **Using The Scan Tool.**

– **Code Lookup**

– **Tool Setup Menu**

- – English/Metric
- – Contrast Adjust
- – Beeper
- – Setup User Key

Datastream Menu

IMPORTANT Items marked with "-" are covered in section 3 of this manual. These items are not covered in this section.

❒ **Datastream Menu**

- ❒ View Data
- ❒ Record Data
- – Review Data
- – Print Data
- – Tool Setup

View Data

The ***View Data*** function allows real time viewing of the vehicle's computer module's PID data. As the computer monitors the vehicle, information is simultaneously transmitted to scan tool.

✓ View data allows the following items to be viewed on the scan tool:

- ☐ Sensor data
- ☐ Operation of switches
- ☐ Operation of solenoids
- ☐ Operation of relays

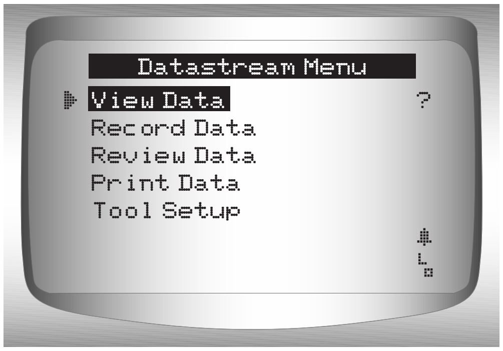
✓ View data can be shown as:

- ☐ Entire Data List
- ☐ Custom Data List

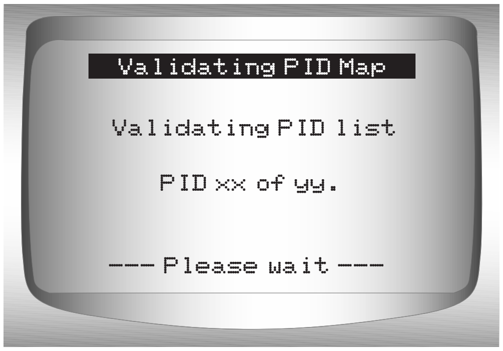
✓ Apart from ***Read Codes***, ***View Data*** is the most useful diagnostic function for isolating the cause of a vehicle operation problem.

From ***Datastream Menu***:

1. **Select *View Data.***
   - •Use **UP** or **DOWN** arrow key until ***View Data*** is highlighted.
   - •Press **ENTER.**



2. **Observe while Scan Tool validates PID MAP.**


Validating PID Map

Validating PID list

PID xx of yy.

--- Please wait ---

✓ Multiple PIDs may be sent if vehicle is equipped with more than one computer module (for example a powertrain control module [PCM] and a transmission control module [TCM]). The Scan Tool identifies them by their identification names (ID) assigned by manufacturer (i.e. $10 or $1A).

✓ If one or more control module stops responding, the Scan Tool displays a message.

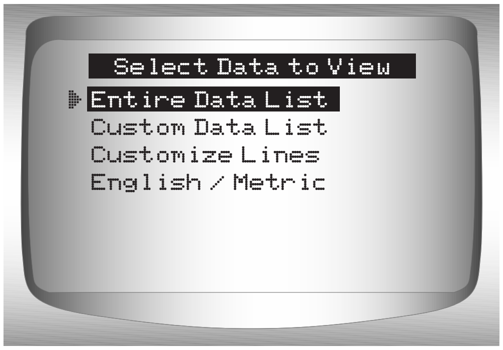
- ❐ If continuing, dashes will replace data in right hand column.
- ❐ If no is selected, then the Scan Tool attempts to re-establish communication with that module.

View Entire List.

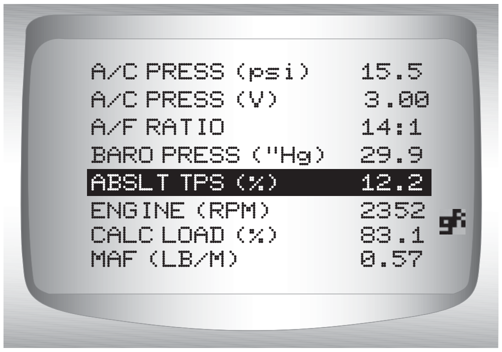
✓ ***View Entire List*** shows all supported PID data for the vehicle being tested.

From ***Select Data to View*** menu:

1. **Select *Entire Data List.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Entire Data List*** is highlighted.
   - •Press **ENTER.**



2. **View PIDs on Scan Tool.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key.

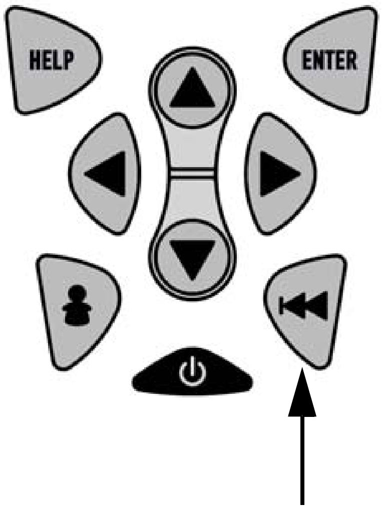


```
A/C PRESS (psi)    15.5
A/C PRESS (V)       3.00
A/F RATIO          14:1
BARO PRESS ("Hg)   29.9
ABSLT TPS (%)      12.2
ENGINE (RPM)       2352
CALC LOAD (%)      83.1
MAF (LB/M)         0.57
```

If the icon displays while a PID is selected press **ENTER** to view graph.

✓ Graphing is only available on 1996 and newer vehicles using an OBD II (J1962) DLC.

3. **Return to *PID Screen.***
   - Press **BACK**.
4. **Return to *Select Data to View Menu.***
   - Press **BACK**.
5. **Return to *Datastream Menu.***
   - Press **BACK**.

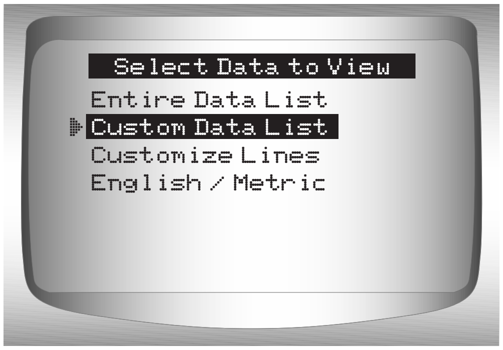


Custom List Select

✓ The ***Custom Data List*** allows certain PIDs from the ***View Entire Data List***, such as those PIDs that apply to a specific driveability symptom or system, to be selected.

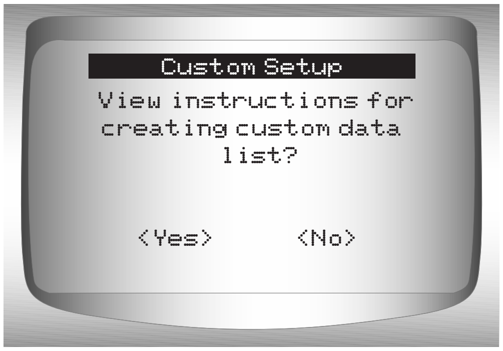
From ***Select Data to View*** menu:

1. **Select *Custom List Select.***
   - Use **UP** or **DOWN** arrow key until ***Custom Data List*** is highlighted.
   - Press **ENTER.**



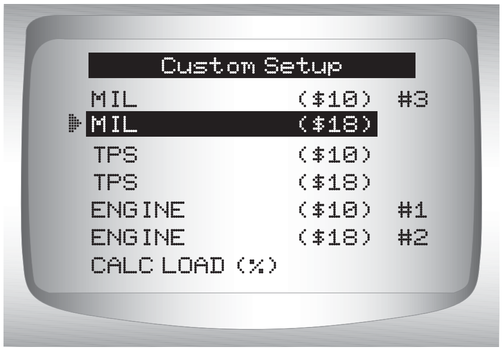
Select Data to View
Entire Data List
Custom Data List
Customize Lines
English / Metric

2. **Select View Instructions or Not.**
   - Use ◀ **LEFT** or ▶ **RIGHT** arrow key.
   - Press **ENTER.**



```
Custom Setup
View instructions for
creating custom data
list?

<Yes>      <No>
```

3. **Select PIDs to View.**
   - Use ▲ **UP** or ▼ **DOWN** arrow keys to move up and down list
   - The ▶ **RIGHT** arrow selects or deselects data parameter. All selected data values are marked with 3 symbol.
   - The ◀ **LEFT** arrow deselects all marked data parameters.
   - The **ENTER** key starts recording data, or displaying selected data parameters.
   - The numbers to the right are the order that the PIDs were picked and will be displayed. This feature is not available on GM and Ford Historic vehicles.

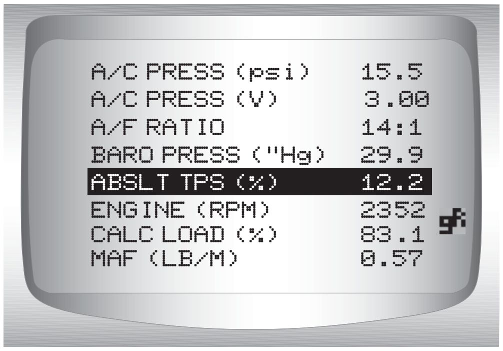


```
Custom Setup
MIL            ($10)  #3
MIL            ($18)
TPS            ($10)
TPS            ($18)
ENGINE         ($10)  #1
ENGINE         ($18)  #2
CALC LOAD (%)
```

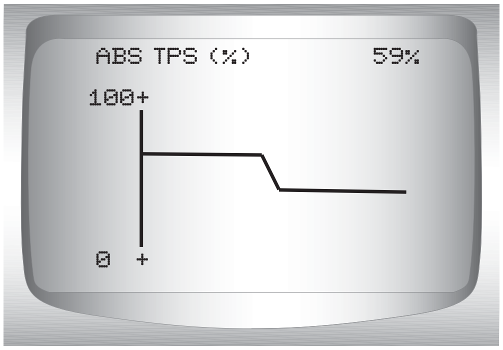
✓ Selected PIDs are kept until:

- ❒ Another vehicle is selected.
- ❒ You erase data stored in the Scan Tool from the previous vehicle tests.

4. **View PIDs on Scan Tool.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key.

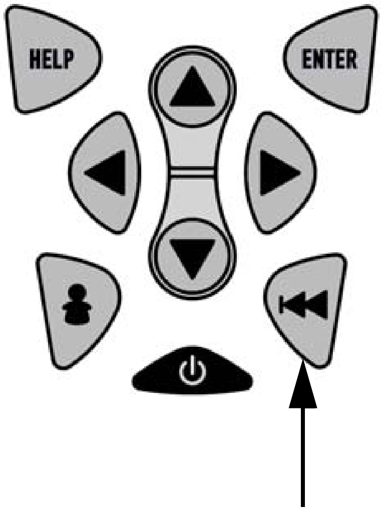


```
A/C PRESS (psi)    15.5
A/C PRESS (V)       3.00
A/F RATIO          14:1
BARO PRESS ("Hg)   29.9
ABSLT TPS (%)      12.2
ENGINE (RPM)       2352
CALC LOAD (%)      83.1
MAF (LB/M)         0.57
```


ABS TPS (%)
59%
100+
0 +

- ✓ If the icon displays while a PID is selected press to view graph. Press **BACK** key to Return to ***PID Screen***.

- ✓ Graphing is only available on 1996 and newer vehicles using an OBD II (J1962) DLC.



5. **Return to *Select Data to View Menu.***
   - •Press **BACK**.

6. **Return to *Datastream Menu.***
   - •Press **BACK**.

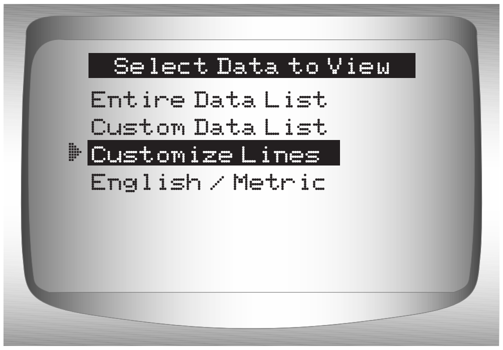
Customize Lines

- ✓ The ***Customize Lines*** allows the number of lines to be shown at one time to be set from 1 to 8.

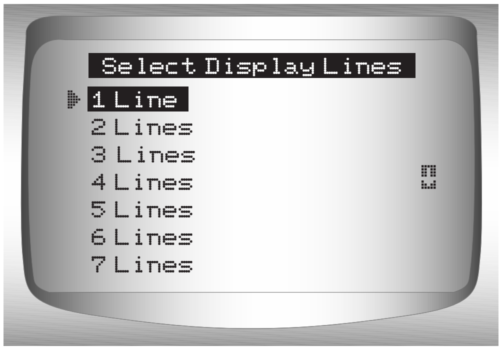
- ✓ Selecting fewer lines provides faster update speeds. The default is a eight-line display.

From ***Select Data to View*** menu:

1. **Select *Customize Lines.***
   - •Use **UP** or **DOWN** arrow key until ***Customize Lines*** is highlighted.
   - •Press **ENTER.**


Select Data to View
Entire Data List
Custom Data List
Customize Lines
English / Metric

2. **Select *Display Lines.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key.
   - •Press **ENTER.**



Select Display Lines
▶1 Line
2 Lines
3 Lines
4 Lines
5 Lines
6 Lines
7 Lines

Note: To change the measurement units, refer to "Changing Measurement Units" on page 3-8 of Using The Scan Tool.

Record Data

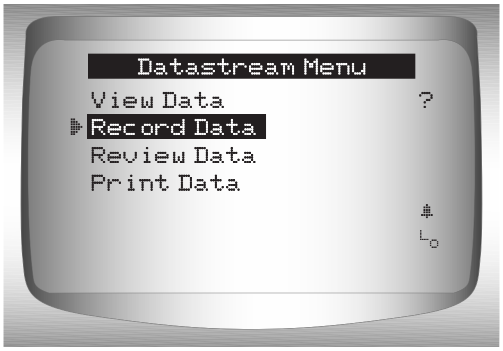
- ✓ The ***Record Data*** function records PIDs while vehicle is parked or being driven.
- ✓ The ***Record Data*** function is mainly used for diagnosing intermittent driveability problems that cannot be isolated by any other method.
- ✓ The recording time varies. A recording consists of frames of data prior to the trigger and several frames after the trigger.
- ✓ Some vehicles wait a long period of time to store a trouble code after a driveability problem occurs. If the operator selected ***Trigger On Codes*** when making a recording, the operator might not see any drastic change in the data parameters before and after trigger point.

⚠CAUTION

Two people must be in vehicle when driving. One to drive and the other to operate the Scan Tool.

From ***Datastream Menu***:

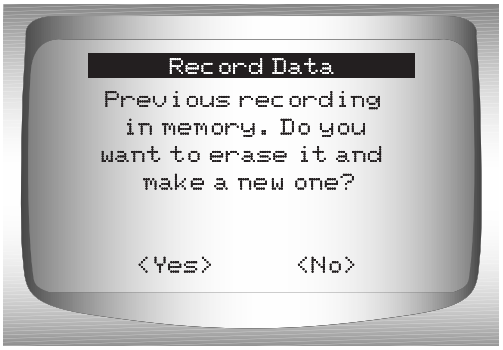
1. **Select *Record Data.***
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***Record Data*** is highlighted.
   - Press **ENTER.**



✓ Follow all instructions on display.

✓ The ScanTool can maintain only one recording. Make sure to thoroughly review old recording before erasing.

✓ If a recording currently exists in memory, a message prompting to erase data is displayed.



Previous recording in memory. Do you want to erase it and make a new one?

✓ Scan Tool validates list of global PIDs from vehicle.

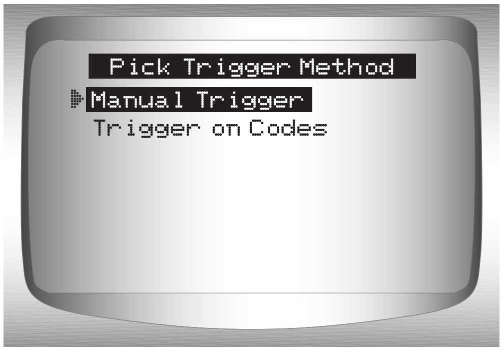
2. **Refer to *View Data* to setup *Custom List* or *View Entire List*.**

✓ There are 2 types of trigger methods used:

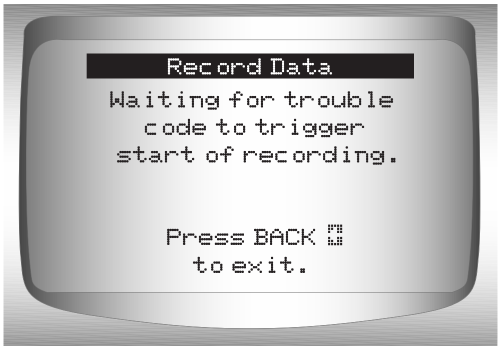
- ❐ *Manual Trigger* - allows operator to use the **ENTER** key to start recording.
- ❐ *Trigger On Codes* - automatically triggers when a diagnostic trouble code (DTC) is detected by vehicle.

✓ Trigger on Codes is not available on all vehicles.

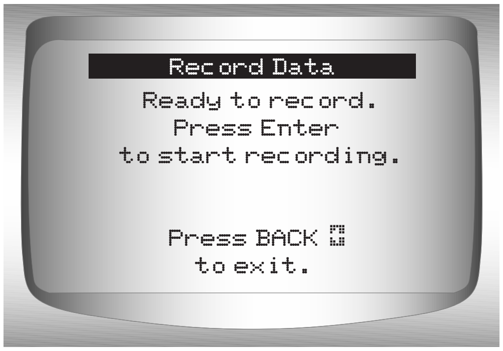
3. **From the *Pick Trigger Method* Screen.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until desired trigger method is highlighted.
   - •Press **ENTER.**


Pick Trigger Method
Manual Trigger
Trigger on Codes

✓ When trigger event (either a DTC or a Press of the **ENTER** key) occurs, time is recorded and data is saved.


Record Data
Waiting for trouble
code to trigger
start of recording.

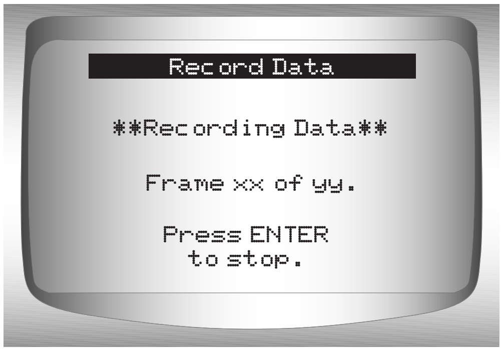
Press BACK
to exit.


Record Data
Ready to record.
Press Enter
to start recording.

Press BACK
to exit.

✓ Data continues to be saved until either:

☐ Record memory is full.
☐ Operator presses **ENTER**.


Record Data

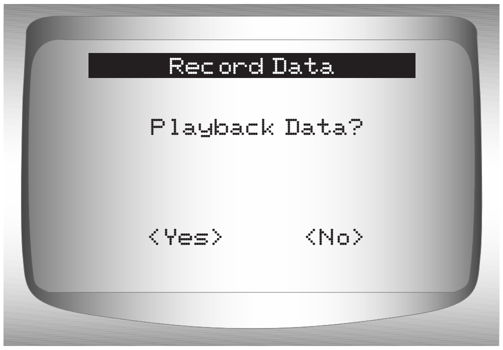
Recording Data

Frame xx of yy.

Press ENTER
to stop.

✓ Scan Tool recording times vary. A recording consists of frames of data prior to trigger and several frames after trigger.

4. **After recording, Scan Tool displays a prompt to *Playback Data*.**
   - Answer ***No*** to return to ***Datastream Menu***.
   - Answer ***Yes*** to display recorded data.
     - ❐ Refer to ***Playback*** from ***Review Data*** and press **ENTER.**



Record Data

Playback Data?

<Yes> <No>

Diagnostic Codes Menu

IMPORTANT Items marked with "-" are covered in section 3 of this manual. These items are not covered in this section.

❐ **Diagnostic Codes Menu**
  - ❐ Read Codes
  - ❐ Pending Codes
  - ❐ Erase Codes
  - ❐ View Freeze Data
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup

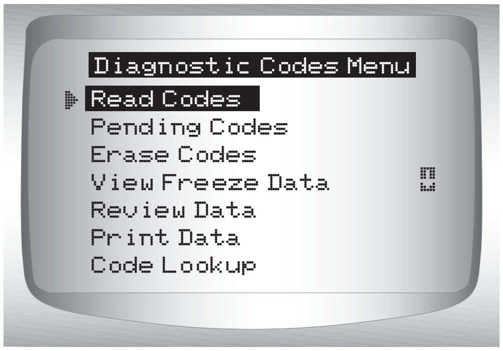
Read Codes

✓ The ***Read Codes*** function allows the Scan Tool to read the DTCs from the vehicle's control modules. DTCs are used to help determine the cause of a problem or problems with a vehicle. These codes cause the control module to illuminate the malfunction indicator lamp (MIL) when emission-related or driveability fault occurs. MIL is also known as service engine soon or check engine lamp.

✓ ***Read Codes*** can be done with the key on engine off (KOEO) or with the key on engine running (KOER).

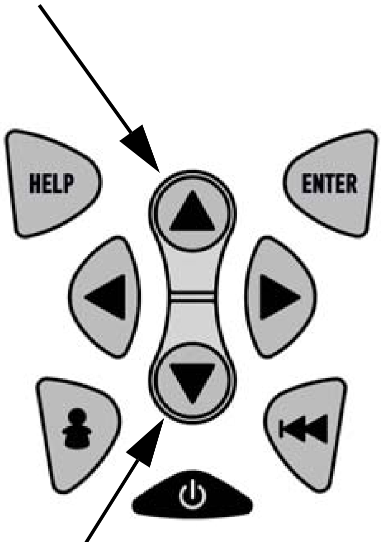
From ***Diagnostic Codes Menu***:

1. **Select *Read Codes.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Read Codes*** is highlighted.
   - •Press ENTER **ENTER.**

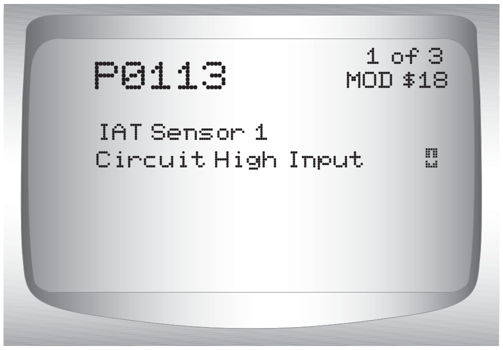

Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

✓ If no DTCs are present a message stating ***System Pass: No Faults Detected*** is displayed.

2. **View and write down DTCs.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key.



☐ In the example shown module (MOD) $18 is reporting the DTCs.

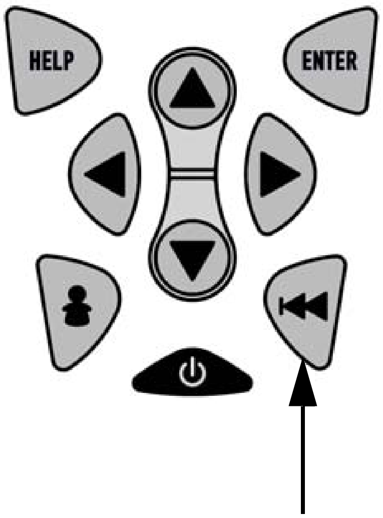


P0113

1 of 3
MOD $18

IAT Sensor 1
Circuit High Input

3. **Return to *Diagnostic Codes Menu.***
   - Press ⏮ **BACK.**



Pending Codes

Pending Codes are also referred to as continuous monitor or maturing codes. An intermittent fault causes the control module to store a code in memory. If the fault does not occur within a certain number of warm-up cycles (depending on vehicle), the code clears from memory. If fault occurs a specific number of times, the code matures into a DTC and the MIL illuminates or blinks. This function can be used with KOEO or KOER

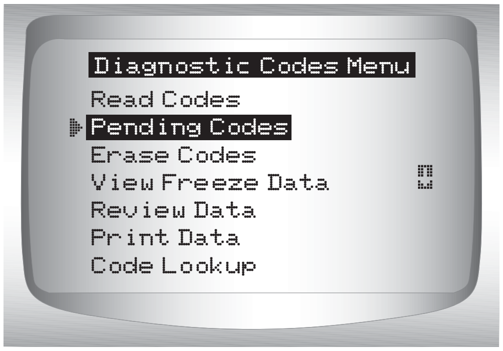
The ***Pending Codes*** function is used to read any pending codes which may be currently set.

✓ ***Pending Codes*** may be set by emission related powertrain components and systems.

✓ ***Pending Codes*** faults **do not** automatically indicate a faulty component or system.

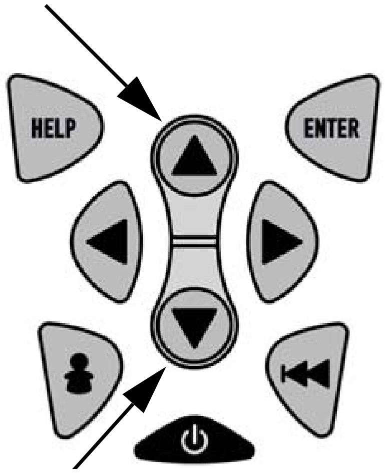
From the ***Diagnostic Codes Menu***:

1. **Select *Pending Codes***
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***Pending Codes*** is highlighted
   - Press **ENTER.**


Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

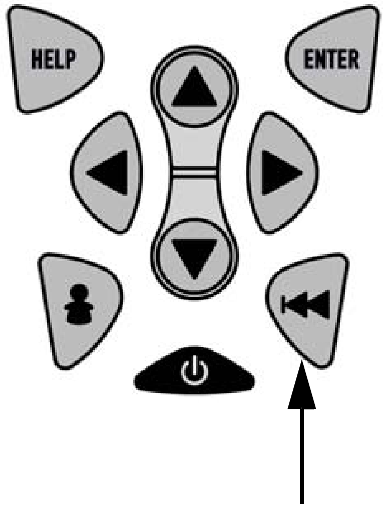
✓ If no ***Pending Codes*** are present a message stating ***System Pass: No Faults Detected*** is displayed. (Do not mistake this message. It refers **only** to Pending Codes and is not a warning of DTCs.)

2. **If *Pending Codes* are Present.**
   - View and write down codes using ▲ **UP** or ▼ **DOWN** arrow key.



✓ See "**Read Codes**" on page 4-12 for details of how DTCs are shown.

3. **Return to *Diagnostic Codes Menu.***
   - Press ⏮ **BACK**.



Erase Codes

The ***Erase Codes*** function deletes DTCs and ***I/M Readiness*** data from vehicle's control module(s). Perform this function with KOEO. **Do not start the engine.**

✓ The ***Erase Codes*** function may also erase ***View Freeze Data***, ***O2 Monitor Test***, and ***Diagnostic Monitor Test*** results depending on vehicle.

✓ The ***Erase Codes*** function sets monitors to ***inc***.

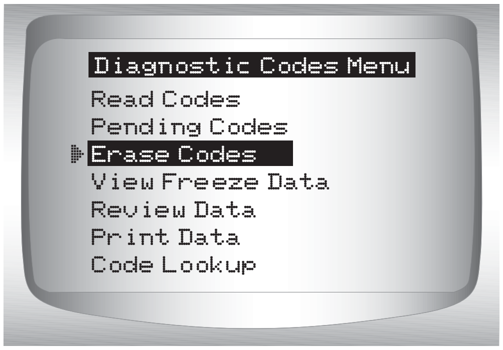
✓ Perform ***Erase Codes*** function **only** after systems have been checked completely and DTCs have been written down.

✓ After servicing the vehicle, erase stored DTCs and verify no codes have been reset. If a DTC returns, problem has not been fixed or other faults are present.

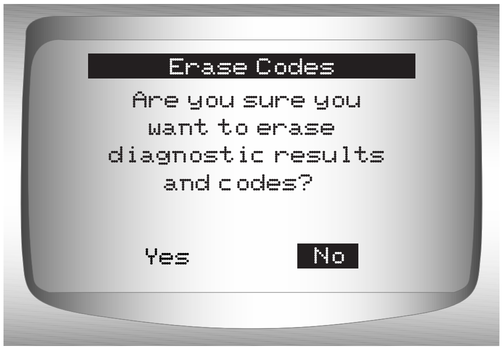
✓ Depending on which monitor sets a code the vehicle may need to be driven and the monitor ran before concluding that the fault is repaired.

From ***Diagnostic Codes Menu:***

1. **Select *Erase Codes.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Erase Codes*** is highlighted.
   - •Press ENTER **ENTER.**


Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

✓ If diagnostic results and codes are not to be erased select **No** and press **ENTER.**

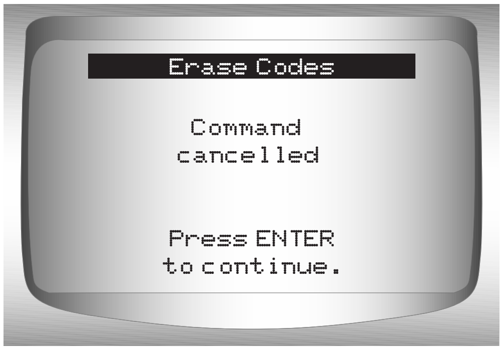


Erase Codes

Are you sure you want to erase diagnostic results and codes?

Yes No

- Selecting **No** displays a ***Command Cancelled*** message prompting to press **ENTER** to return to ***Diagnostic Codes Menu***.



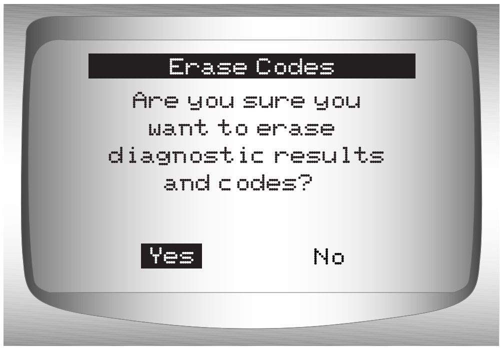
Erase Codes

Command cancelled

Press ENTER to continue.

2. Select Yes to erase diagnostic results and codes.

- Use **LEFT** arrow key.
- Press **ENTER.**



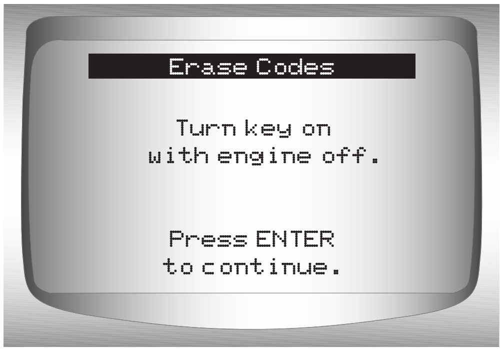
Erase Codes

Are you sure you want to erase diagnostic results and codes?

Yes No

3. Prepare Vehicle.

- Turn key on.
- Leave engine off.
- Press **ENTER**.

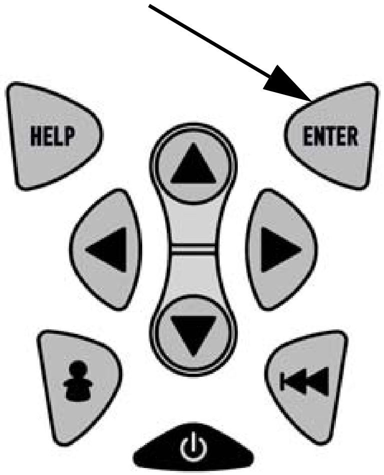


Erase Codes

Turn key on with engine off.

Press ENTER to continue.

4. **Observe *Command Sent* message is displayed.**
   •Press **ENTER.**



5. **Return to *Diagnostic Codes Menu*.**
   •Press **ENTER.**

View Freeze Data

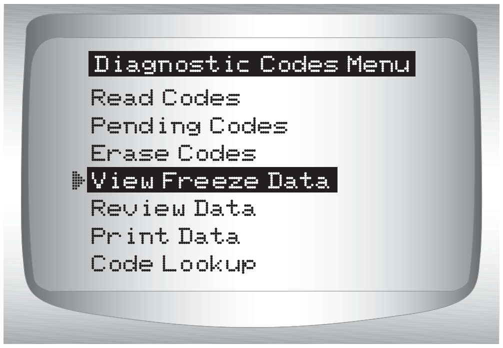
When an emission-related fault occurs, certain vehicle conditions are recorded by the on-board computer. This information is referred to as freeze frame data. ***View Freeze Data*** is a snapshot of the operating conditions at the time of an emission-related fault.

✓ ***View Freeze Data*** can be overwritten by faults with a higher priority.

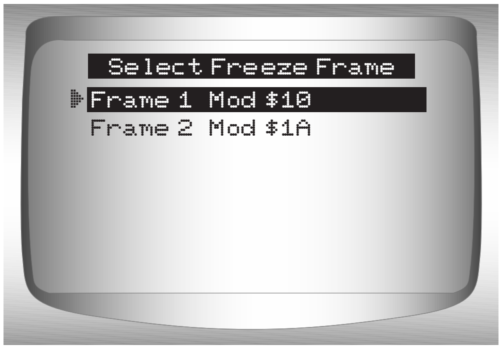
✓ If codes were erased, ***View Freeze Data*** may not be stored in vehicle memory depending on vehicle.

From the ***Diagnostic Codes Menu:***

1. **Select *View Freeze Data.***
   •Use ▲ **UP** or ▼ **DOWN** arrow key until ***View Freeze Data*** is highlighted.
   •Press **ENTER.**


Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

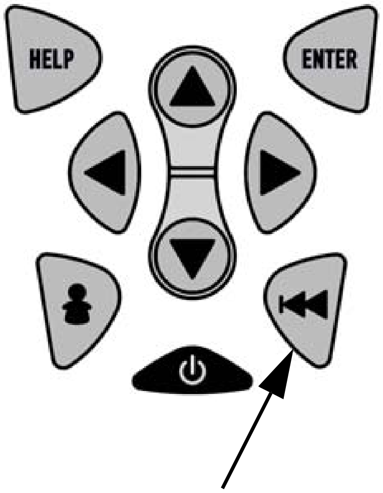
2. **Select Frame (if more than 1 frame is present).**
   •Use ▲ **UP** or ▼ **DOWN** arrow key.
   •Press **ENTER.**



```
Select Freeze Frame
▶Frame 1  Mod $10
 Frame 2  Mod $1A
```

3. **Select another frame to view (if available)**
   •Press **BACK**.

4. **Return to *Diagnostic Codes Menu***
   •Press **BACK**.



Special Tests Menu

IMPORTANT Items marked with "-" are covered in section 3 of this manual. These items are not covered in this section.

- ☐ **Special Tests Menu**
  - ☐ I/M Readiness
  - ☐ Drive Cycle Monitor
  - ☐ State OBD Check
  - ☐ O2 Monitor Test
  - ☐ Diagnostic Monitor Test
  - ☐ On-Board Systems
  - ☐ Vehicle Information
  - ☐ Modules Present
  - – Review Data
  - – Print Data
  - – Tool Setup

I/M Readiness

The ***I/M Readiness*** (Inspection / Maintenance) function is used to view a **snapshot** of the operations for the emission system on OBD II vehicles.

✓ I/M Readiness is a very useful function. To guarantee no faults exist make sure all monitors are **ok** or **n/a** and **no DTC's** exist.

✓ Refer to the vehicles service manual for the drive cycle operation.

✓ During normal driving conditions, the vehicle's computer scans the emission system. After a specific amount of drive time (each monitor has specific driving conditions and time required), the computer's monitors decide if the vehicles emission system is working correctly or not as well as detecting out of range values. When the monitor's status is:

- **ok -** vehicle was driven enough to complete the monitor.
- **inc (Incomplete) -** vehicle was not driven enough to complete the monitor.
- **n/a (Not Applicable)-** vehicle does not support that monitor.

✓ Depending on vehicle, disconnecting or a discharged battery may erase DTCs and clear monitor status.

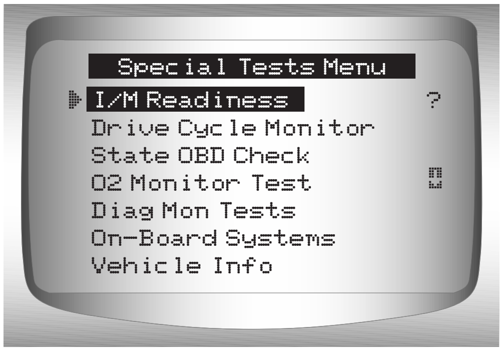
✓ Monitors may be cleared by:

☐ Erasing codes
☐ Vehicle control modules losing power

✓ ***I/M Readiness*** can be done with the KOER or KOEO.

From the ***Special Tests Menu:***

1. **Select *I/M Readiness.***
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***I/M Readiness*** is highlighted.
   - Press **ENTER.**

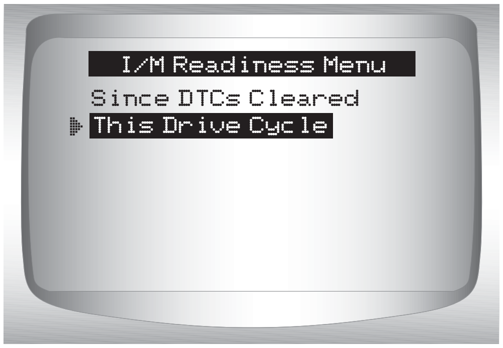

Special Tests Menu
I/M Readiness
?
Drive Cycle Monitor
State OBD Check
O2 Monitor Test
Diag Mon Tests
On-Board Systems
Vehicle Info

Two types of ***I/M Readiness*** test are:

☐ ***Since DTCs Cleared -*** shows status of the monitors since the DTCs were last erased.

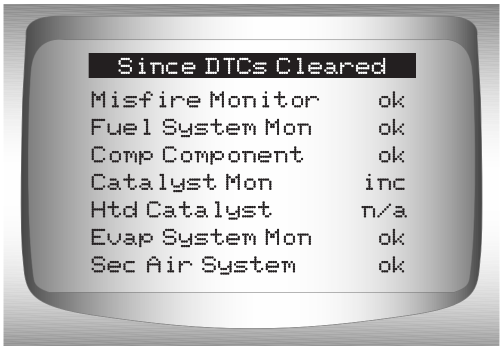
☐ ***This Drive Cycle -*** shows status of monitors since the start of the current drive cycle. Refer to the vehicle service manual for more detailed information on emission-related monitors and their status.

✓ Some vehicles **do not** support ***This Drive Cycle***. If vehicle supports both types of monitors the ***I/M Readiness Menu*** displays.


I/M Readiness Menu
Since DTCs Cleared
This Drive Cycle

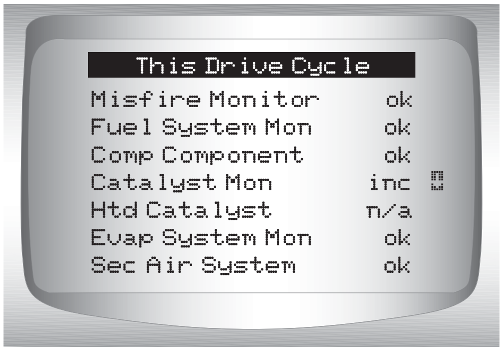
2. **View Summary of Monitor Status.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key (if required).

✓ Depending on ***Readiness Test*** one of these 2 screens will be present



```
Since DTCs Cleared
Misfire Monitor     ok
Fuel System Mon     ok
Comp Component      ok
Catalyst Mon       inc
Htd Catalyst       n/a
Evap System Mon     ok
Sec Air System      ok
```

. OR

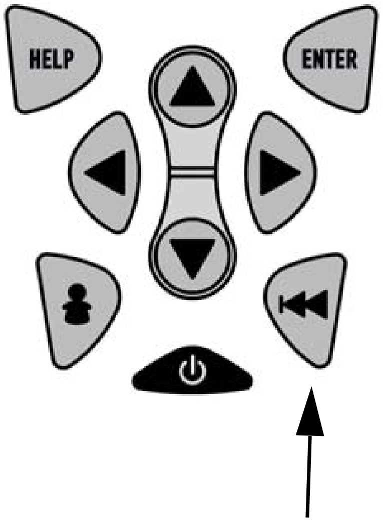


```
This Drive Cycle
Misfire Monitor     ok
Fuel System Mon     ok
Comp Component      ok
Catalyst Mon       inc
Htd Catalyst       n/a
Evap System Mon     ok
Sec Air System      ok
```

Abbreviations and names for OBD II Monitors supported by the Scan Tool are shown below. They are required by the United States Environmental Protection Agency (EPA). Not all monitors are supported by all vehicles.

•Abbreviated Name	**Expanded Name**
- Misfire Monitor	Misfire Monitor
- Fuel System Mon	Fuel System Monitor
- Comp Component	Comprehensive Components Monitor
- Catalyst Mon	Catalyst Monitor
- Htd Catalyst	Heated Catalyst Monitor
- Evap System Mon	Evaporative System Monitor
- Sec Air System	Secondary Air System Monitor
- A/C Refrig Mon	Air Conditioning Refrigerant Monitor
- Oxygen Sens Mon	Oxygen Sensor Monitor
- Oxygen Sens Htr	Oxygen Sensor Heater Monitor
- EGR System Mon	Exhaust Gas Recirculation System Monitor

3. **Return to *Special Tests Menu.***
   •Press ⏮ **BACK**.



Drive Cycle Monitor

The ***Drive Cycle Monitor*** function is very similar to the I/M Monitors though the ***Drive Cycle Monitor*** is used to view **REAL TIME** operations of the Emissions System on OBD II vehicles.

✓ ***Drive Cycle Monitor*** continuously updates as the vehicle reports operations of the Emission System.

✓ Refer to the vehicle service manual for the drive cycle operation.

✓ During normal driving conditions, the vehicle computer scans the emission system. After a specific amount of drive time (each monitor has specific driving conditions and time requirements), the computer's monitors will decide if the vehicle emissions system is working correctly or not as well as detecting out a range of values. When the monitor's status is:

- **"ok"** - vehicle has been driven enough for function.
- **"inc" (Incomplete)** - vehicle was not driven enough to complete all of the monitors.
- **"n/a" (Not Applicable)** - vehicle does not support that monitor.

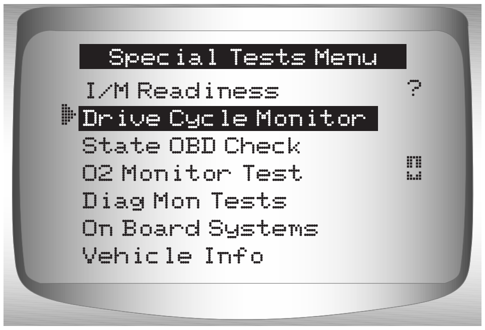
✓ **Clear Monitors by:**

❒ Erasing Codes.
❒ Vehicle Computer Module losing power (on some vehicles).

From the ***Special Tests Menu:***

1. Select *Drive Cycle Monitor.*

- Use ▲ **UP** or ▼ **DOWN** arrow key to highlight ***Drive Cycle Monitors***.
- Press **ENTER**.

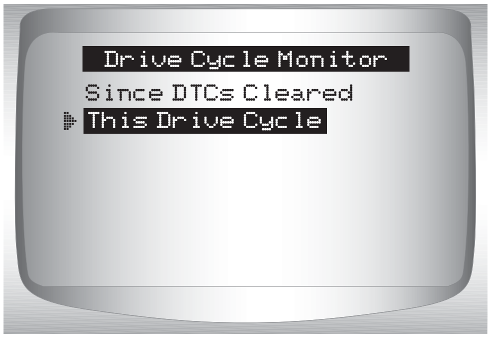

Special Tests Menu
I/M Readiness
Drive Cycle Monitor
State OBD Check
O2 Monitor Test
Diag Mon Tests
On Board Systems
Vehicle Info
?

✓ Two types of ***Drive Cycle Monitors*** are:

☐ ***SINCE DTCs CLEARED*** shows status of the monitors since the Diagnostic Trouble Codes were last erased.

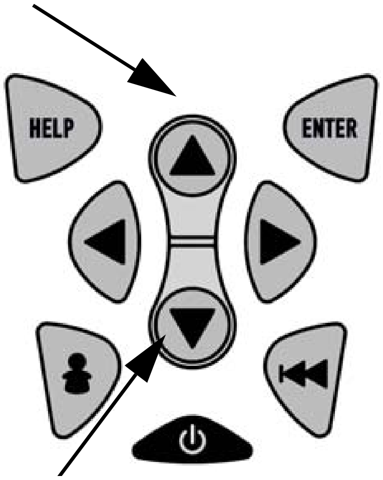
☐ ***THIS DRIVE CYCLE*** shows status of monitors since start of current drive cycle. Refer to the vehicle service manual for more detailed information on emission-related monitors and their status.

✓ Some vehicles **DO NOT** support ***Drive Cycle Monitors***. If vehicle supports both types of ***Drive Cycle Monitors*** the Menu will display.

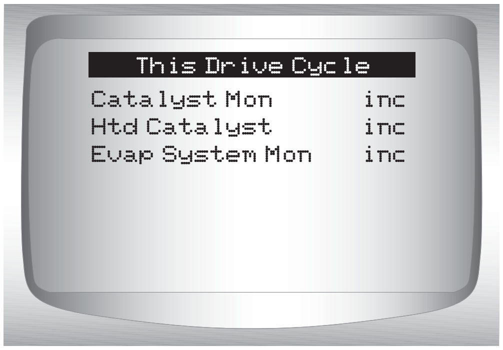

Drive Cycle Monitor
Since DTCs Cleared
This Drive Cycle

2. View Summary of Monitor Status.

- Use ▲ **UP** or ▼ **DOWN** arrow key (if required).

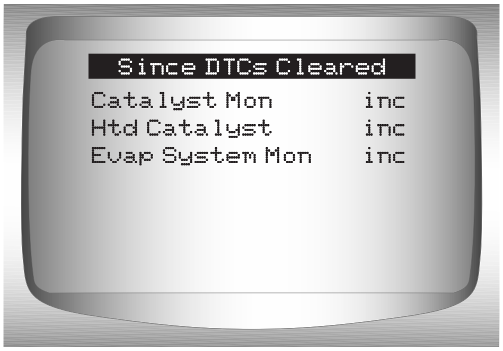


3.Depending on the ***Drive Cycle Monitors*** one of these 2 screens will be present.



```
This Drive Cycle
Catalyst Mon        inc
Htd Catalyst        inc
Evap System Mon     inc
```

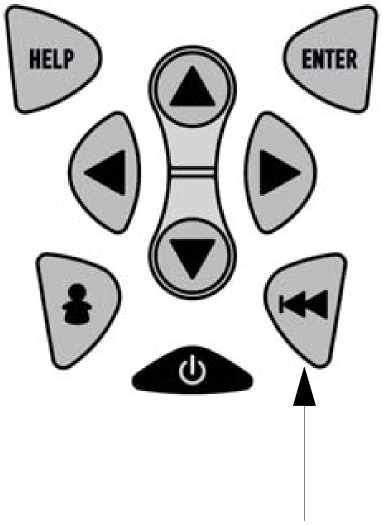
OR



```
Since DTCs Cleared
Catalyst Mon        inc
Htd Catalyst        inc
Evap System Mon     inc
```

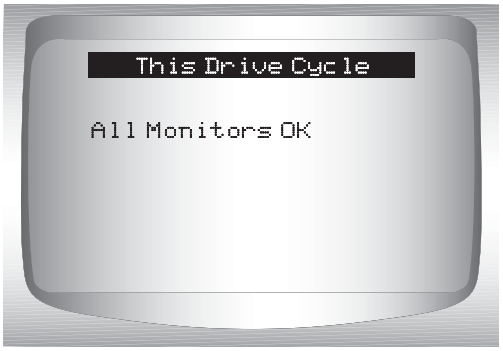
4.Return to *Special Tests Menu.*

- Press **BACK** key.



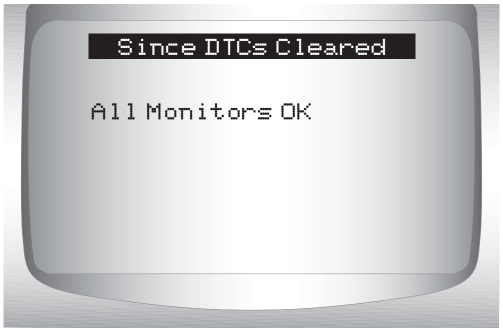
✓ The Scan Tool display is continuously updated. Monitors that are “ok” will disappear and only the “inc” monitors will remain displayed. Monitors designated “n/a” are not displayed.

✓ When all Monitors are **“OK”** the following Screen is shown.



```
This Drive Cycle

All Monitors OK
```

OR



```
Since DTCs Cleared

All Monitors OK
```

State OBD Check

The ***State OBD Check*** function is used to display a basic status of the vehicles OBD system.

- ❒ Malfunction Indicator Lamp (MIL) Status
- ❒ Codes Found
- ❒ I/M Readiness

Erase Codes deletes DTCs and clears I/M Monitors from vehicle's computer module(s).

✓ The ***State OBD Check*** function has the following areas:

- ❒ MIL STATUS ON or OFF
- ❒ Number of Codes Found
- ❒ Number of Monitors OK
- ❒ Number of Monitors Inc
- ❒ Number of Monitors N/A

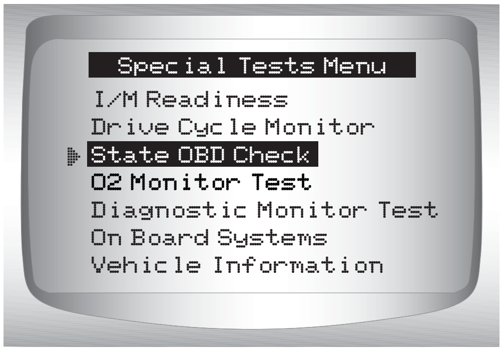
✓ ***State OBD Check*** should be done with the key on engine running (KOER) due to showing MIL status.

✓ The number of codes found are **only** Generic OBD II codes and **not** Pending codes.

✓ The number of Monitors that are either OK, INC or NA are **only** Since DTCs Cleared and **not** This Drive Cycle.

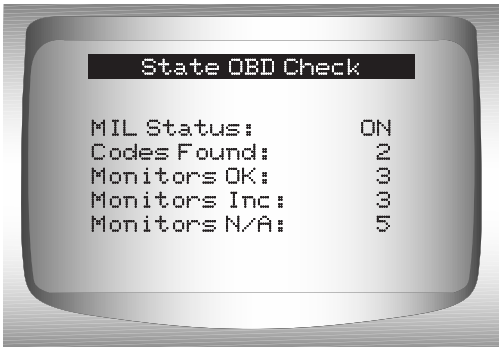
✓ Refer to ***Read Codes*** and ***I/M Monitors*** for more detailed information about the results.

From the ***Special Tests Menu:***


Special Tests Menu
I/M Readiness
Drive Cycle Monitor
State OBD Check
O2 Monitor Test
Diagnostic Monitor Test
On Board Systems
Vehicle Information

1. **Select *State OBD Check***
   - •Use **UP** or **DOWN** arrow key until ***State OBD Check*** is highlighted
   - •Press **ENTER.**

2. **View State OBD Check Display.**



State OBD Check

MIL Status: ON
Codes Found: 2
Monitors OK: 3
Monitors Inc: 3
Monitors N/A: 5

3. **Return to Special Tests Menu.**
   - •Press **BACK**

O2 Monitor Test

OBD II regulations require applicable vehicles monitor and test oxygen (O2) sensors to determine problems related to fuel and emissions. The ***O2 Monitor Test*** allows retrieval of completed O2 sensors monitor test results.

✓ **The *O2 Monitor Test* is not an on-demand test.** O2 sensors are **not** tested when selected via the menu. O2 sensors are tested when engine operating conditions are within specified limits.

✓ If the vehicle communicates using a controller area network (CAN), O2 monitor tests are not supported by vehicle. A message is displayed. See ***"*Diagnostic Monitor Tests**" on page 4-30 to see O2 monitor data.

✓ O2 sensors are located before (upstream) and after (downstream) catalyst(s). Sensors are named (xy) for their position to both cylinder banks and catalysts.

- ❐ The O2 sensor for cylinder bank 1 has prefix **1**y while O2 sensor for cylinder bank 2 has prefix **2**y.
- ❐ The O2 sensor upstream of catalyst (closest to engine) has suffix x**1** while O2 sensor downstream of catalyst has suffix x**2**. If vehicle contains more catalysts, O2 sensor downstream of second catalyst has suffix x**3** and O2 sensor downstream of next catalyst has suffix x**4**.
- ❐ For example, **O2S21** is upstream O2 sensor for cylinder bank 2.

The following *O2 Sensor Tests* are available:

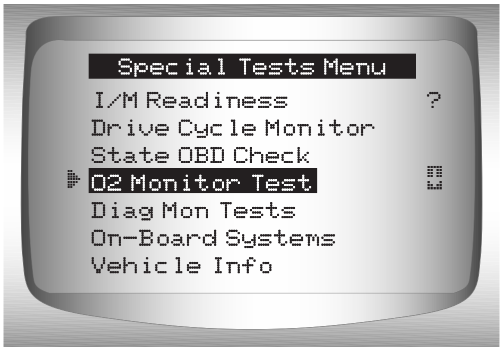
1) Rich-to-lean sensor threshold voltage
2) Lean-to-rich sensor threshold voltage
3) Low sensor voltage for switch time
4) High sensor voltage for switch time
5) Rich-to-lean sensor switch time
6) Lean-to-rich sensor switch time
7) Minimum sensor voltage test cycle
8) Maximum sensor voltage test cycle
9) Time between sensor transitions
10) Sensor period
11) Manufacturer specific tests

From the ***Special Tests Menu:***

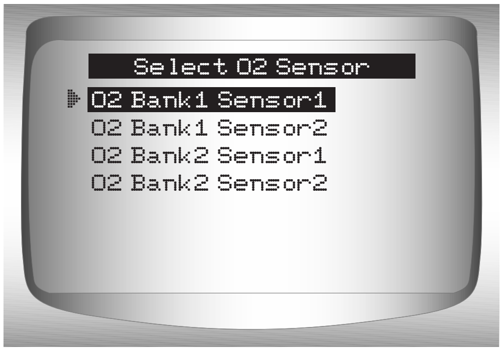
1. Select ***O2 Monitor Test.***

•Use ▲ **UP** or ▼ **DOWN** arrow key until ***O2 Monitor Test*** is highlighted.

•Press **ENTER**.


Special Tests Menu
I/M Readiness
?
Drive Cycle Monitor
State OBD Check
O2 Monitor Test
Diag Mon Tests
On-Board Systems
Vehicle Info

2. ***Select O2 Sensor.***
   - Use ▲ **UP** or ▼ **DOWN** arrow key until desired O2 Sensor is highlighted.
   - Press **ENTER.**

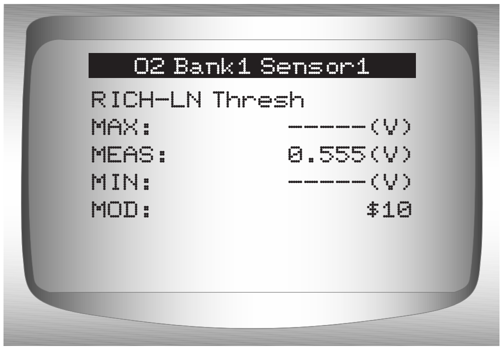


```
Select O2 Sensor
O2 Bank1 Sensor1
O2 Bank1 Sensor2
O2 Bank2 Sensor1
O2 Bank2 Sensor2
```

✓ The O2 sensors located upstream (before catalyst) may perform differently than ones located downstream (after catalyst).

✓ Test IDs are shown for unknown O2 sensor tests.

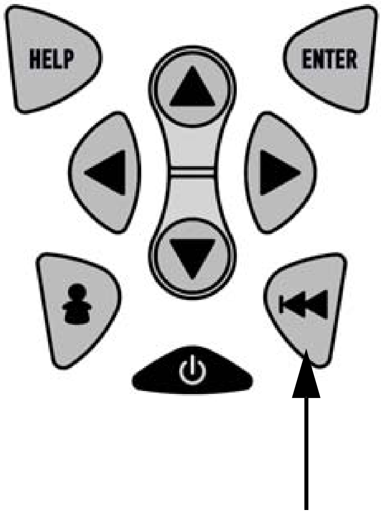
3. **View Results of Selection.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key.



```
O2 Bank1 Sensor1
RICH-LN Thresh
MAX:          -----(V)
MEAS:         0.555(V)
MIN:          -----(V)
MOD:               $10
```

4. **Return to *O2 Sensor Tests* menu.**
   - Press **BACK**.

5. **Return to *Special Tests Menu.***
   - Press **BACK**.



Diagnostic Monitor Tests

The ***Diagnostic Monitor Test*** function is useful after servicing or after erasing a vehicle's memory. Test results do not necessarily indicate a faulty component or system.

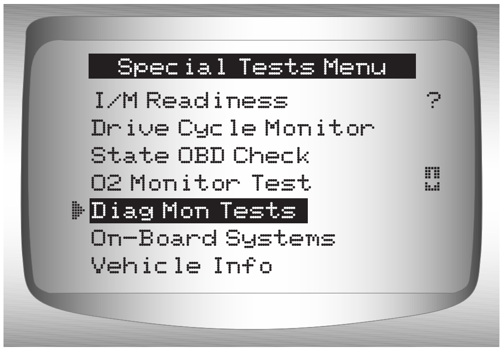
✓ *Non-CAN vehicles* ***Diagnostic Monitor Test*** receives test results for emission-related powertrain components and systems that are **not continuously monitored.**

✓ *CAN vehicles* ***Diagnostic Monitor Test*** receives test results for emission-related powertrain components and systems that **are and are not continuously monitored.**

✓ Vehicle manufacturer is responsible for assigning test and component IDs.

From the ***Special Tests Menu:***

1. **Select *Diag Mon Tests.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Diag Mon Tests*** is highlighted.
   - •Press **ENTER.**

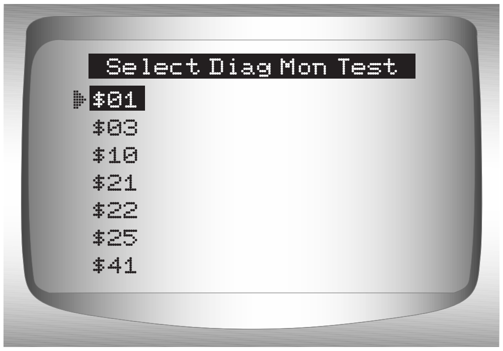


Special Tests Menu
I/M Readiness ?
Drive Cycle Monitor
State OBD Check
O2 Monitor Test
▶Diag Mon Tests
On-Board Systems
Vehicle Info

✓ Applicable ***Diagnostic Monitor Tests*** are displayed.

2. **Review test results displayed on Scan Tool.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until desired test results is highlighted.
   - •Press **ENTER.**

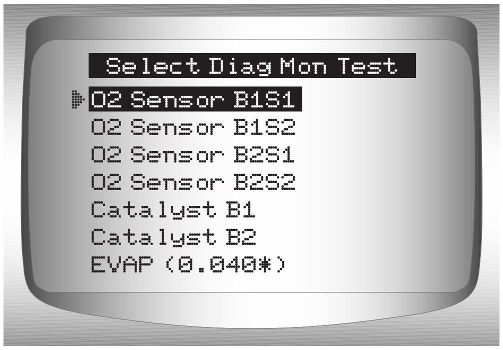
✓ Refer to appropriate vehicle service manual for test IDs and definitions.



```
Select Diag Mon Test
▶$01
 $03
 $10
 $21
 $22
 $25
 $41
```

Non-CAN Vehicles

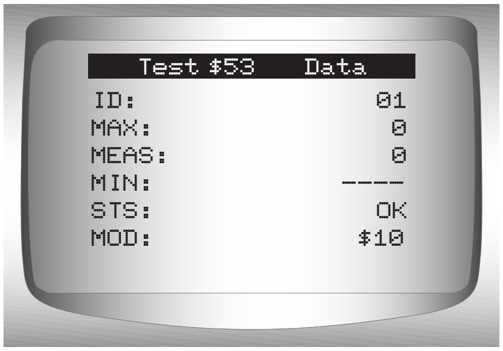
OR



```
Select Diag Mon Test
▶O2 Sensor B1S1
 O2 Sensor B1S2
 O2 Sensor B2S1
 O2 Sensor B2S2
 Catalyst B1
 Catalyst B2
 EVAP (0.040*)
```

CAN Vehicles

- ✓ On *Non-CAN vehicles* the Scan Tool displays:
  - ☐ Test data (test ID)
  - ☐ Maximum value (MAX)
  - ☐ Test measurements (MEAS)
  - ☐ Minimum value (MIN)
  - ☐ Status (STS)
  - ☐ Measurements and Specification values are hexadecimal numbers (i.e., $1A, $FE, $11.)
  - ☐ Module (MOD)

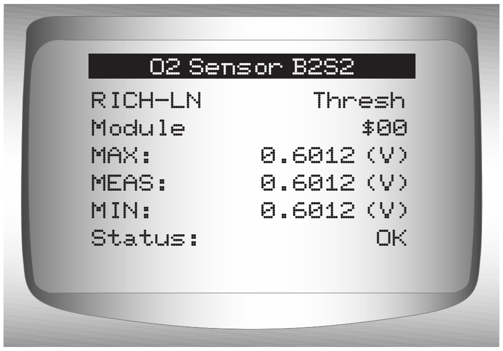


```
Test $53    Data
ID:           01
MAX:           0
MEAS:          0
MIN:        ----
STS:          OK
MOD:         $10
```

Non-CAN Vehicles

OR

- ✓ On *CAN vehicles* Scan Tool displays:
  - ☐ Test performed. The test performed can be $## if test is not defined. Refer to vehicle service manual for details.
  - ☐ Measured values and units of measured (such as volts, amps, and seconds).
  - ☐ Status of monitor test data.
  - ☐ Module ID where the monitor test data came from.

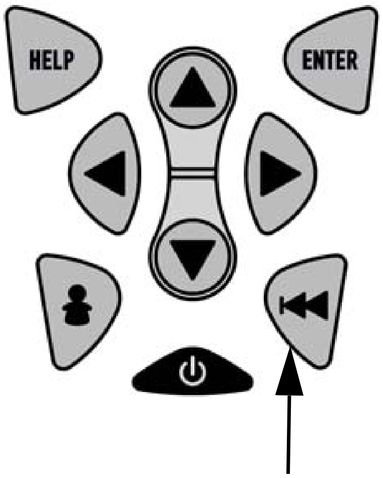


```
  O2 Sensor B2S2
RICH-LN      Thresh
Module          $00
MAX:     0.6012 (V)
MEAS:    0.6012 (V)
MIN:     0.6012 (V)
Status:          OK
```

CAN Vehicles

3. **Return to *Select Test Menu.***
   •Press ⏮ **BACK** key.

4. **Return to *Special Tests Menu.***
   •Press ⏮ **BACK** key.



On-Board Systems

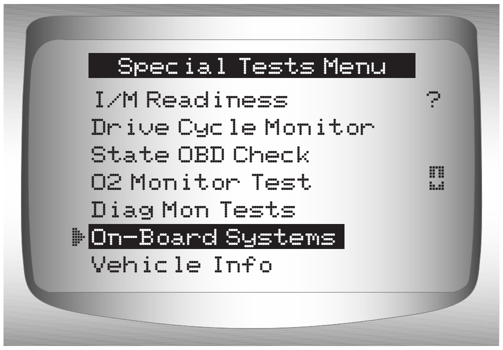
The ***On-Board Systems*** test allows the Scan Tool to control operation of vehicle components, tests or systems.

✓ Some manufacturers do not allow tools to control vehicle systems. A vehicle not supporting an on-board system is identified by a message that is displayed when selected.

✓ Refer to the vehicle service manual for on-board systems instructions.

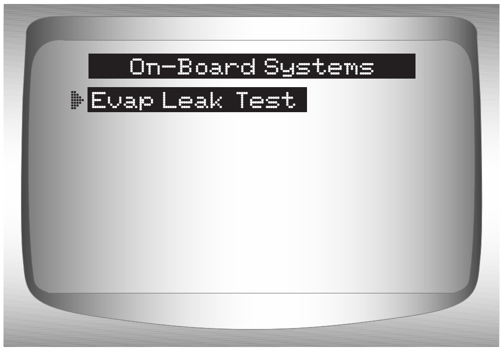
From the **Special Tests Menu:**

1. **Select *On-Board Systems.***
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***On-Board Systems*** is highlighted.
   - Press **ENTER.**


Special Tests Menu
I/M Readiness ?
Drive Cycle Monitor
State OBD Check
O2 Monitor Test
Diag Mon Tests
On-Board Systems
Vehicle Info

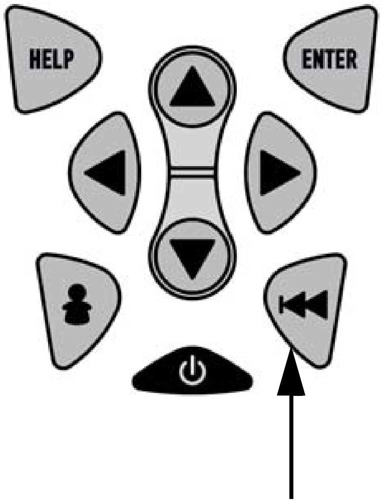
✓ A list of on-board systems and components available for testing are shown on the display.

2. **Select Test.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key.
   - Press **ENTER**.


On-Board Systems
Evap Leak Test

3. **Return to *On-Board Systems*** menu.
   - Press **BACK** key.

4. **Return to *Special Tests Menu.***
   - Press **BACK** key.



✓ The manufacturer is responsible for determining the criteria to automatically stop test. Refer to appropriate vehicle service manual.

Vehicle Info

The ***Vehicle Info*** function allows the Scan Tool to request the vehicle's VIN number, calibration ID(s) which identifies software version in vehicle control module(s), calibration verification numbers (CVN(s)) and in-use performance tracking.

✓ ***Vehicle Info*** function applies to model year 2000 and newer OBD II compliant vehicles.

✓ The Scan Tool cannot verify if data is correct for scanned vehicles.

✓ CVNs are calculated values required by OBD II regulations.

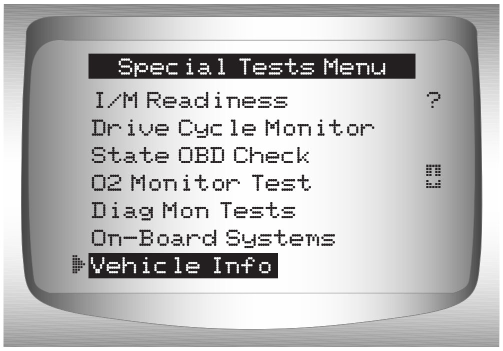
✓ The CVN calculation may take several minutes.

✓ CVNs are reported to determine if emission-related calibrations have been changed. Multiple CVNs may be reported for a control module.

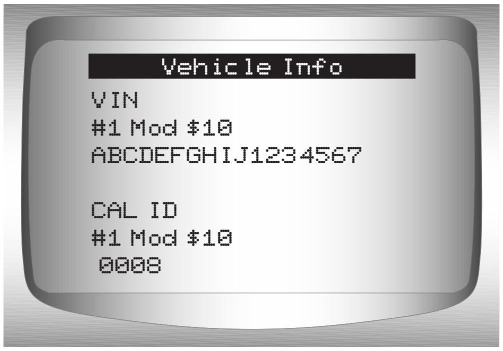
✓ In-use performance tracking, tracks performance of key readiness Monitors.

From the **Special Tests Menu:**

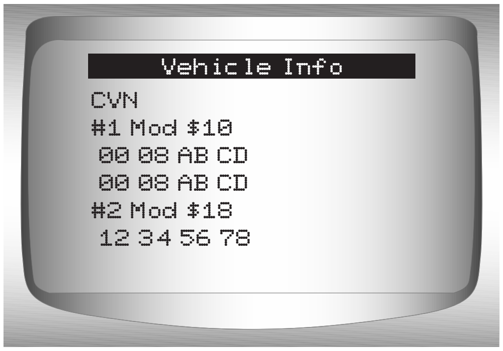
1. **Select *Vehicle Info*.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Vehicle Info*** is highlighted.
   - •Press **ENTER.**


Special Tests Menu
I/M Readiness
?
Drive Cycle Monitor
State OBD Check
O2 Monitor Test
Diag Mon Tests
On-Board Systems
Vehicle Info

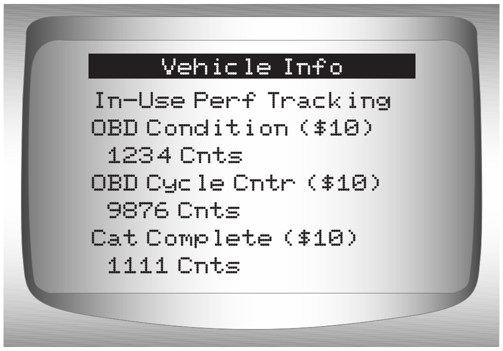
2. **View Information Supported by Vehicle.**
   - Use ▲ UP or ▼ DOWN arrow key (if required).



```
Vehicle Info
VIN
#1 Mod $10
ABCDEFGHIJ1234567

CAL ID
#1 Mod $10
 0008
```



```
Vehicle Info
CVN
#1 Mod $10
 00 08 AB CD
 00 08 AB CD
#2 Mod $18
 12 34 56 78
```



```
Vehicle Info
In-Use Perf Tracking
OBD Condition ($10)
  1234 Cnts
OBD Cycle Cntr ($10)
  9876 Cnts
Cat Complete ($10)
  1111 Cnts
```

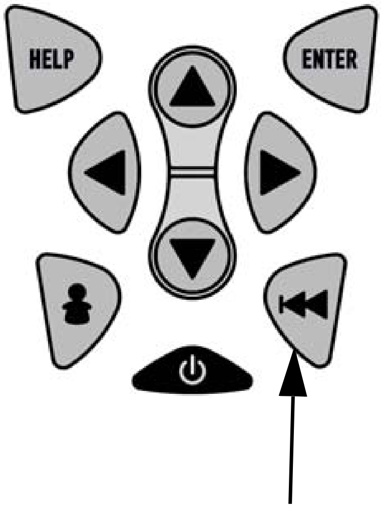
✓ In the above examples, Module $10 and $18 returned data. Scroll down to view information. CVNs are shown as hexadecimal numbers.

✓ Abbreviations and names for in-use performance tracking data supported by Scan Tool are shown below. Not all data is supported by all vehicles.

Abbreviated Name	Expanded Name
In-Use Perf Tracking	In-Use Performance Tracking
OBD Mon Cond	OBD Monitoring Conditions Encountered Counts
Ignition Cycles	Ignition Counter
Cat Comp Bank x	Catalyst Monitor Completion Counts Bank x
Cat Cond Bank x	Catalyst Monitor Conditions Encountered Counts Bank x
O2 Comp Bank x	O2 Sensor Monitor Completion Counts Bank x
O2 Cond Bank x	O2 Sensor Conditions Encountered Counts Bank x
EGR Mon Comp	EGR Monitor Completion Condition Counts
EGR Mon Cond	EGR Monitor Conditions Encountered Counts
AIR Mon Comp	AIR Monitor Completion Condition Counts (Secondary Air)
AIR Mon Cond	AIR Monitor Conditions Encountered Counts (Secondary Air)
EVAP Mon Comp	EVAP Monitor Completion Condition Counts
EVAP Mon Cond	EVAP Monitor Conditions Encountered Counts

✓ If message INVALID displays on screen, then data returned from the vehicle is incorrect, or is not formatted in accordance with OBD II specification.

3. **Return to *Special Tests Menu:***
   •Press **BACK** or **ENTER** key.

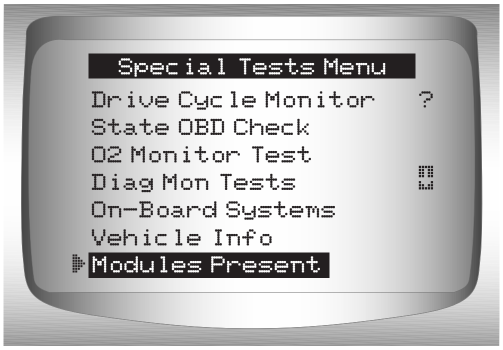


Modules Present

The Scan Tool identifies the module IDs and communication type for OBD II modules in the vehicle.

From the **Special Tests Menu:**

1. **Select *Modules Present.***
   - •Use UP or DOWN arrow key until ***Modules Present*** is highlighted.
   - •Press **ENTER.**

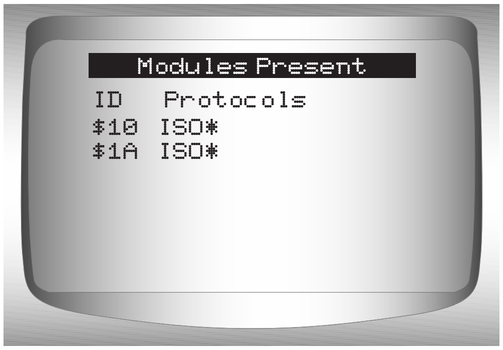


```
Special Tests Menu
Drive Cycle Monitor   ?
State OBD Check
O2 Monitor Test
Diag Mon Tests
On-Board Systems
Vehicle Info
Modules Present
```

4

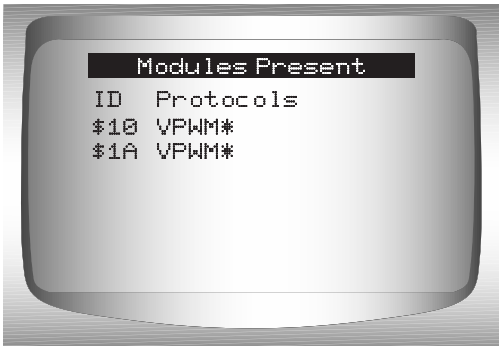
✓ The types of protocols (communication types) supported by the Scan Tool are:

❒ ISO 9141-2 protocol is shown as ISO.



```
Modules Present
ID   Protocols
$10  ISO*
$1A  ISO*
```

❒ SAE J1850 protocol is shown as VPWM or PWM.



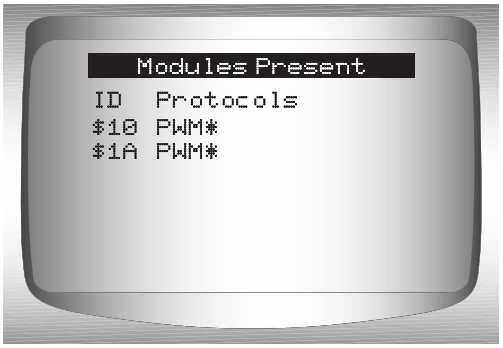
Modules Present

ID Protocols

$10 VPWM*

$1A VPWM*

OR



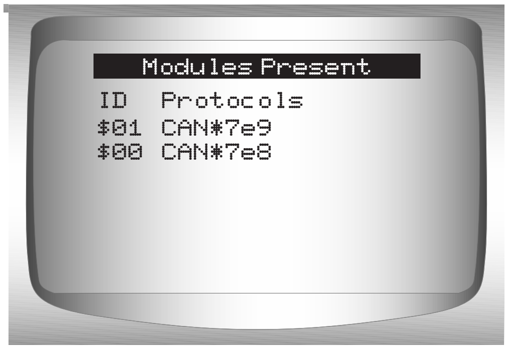
Modules Present

ID Protocols

$10 PWM*

$1A PWM*

❒ ISO 15765-4 protocol is shown as CAN.



Modules Present

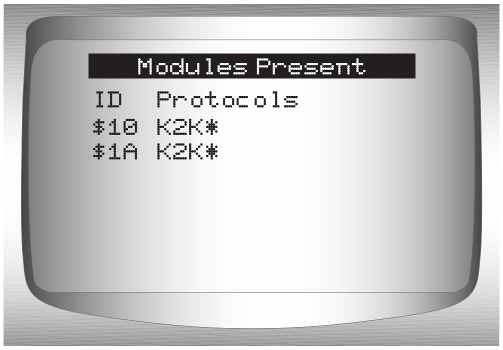
ID Protocols

$01 CAN*7e9

$00 CAN*7e8

✓ Since CAN vehicles use module IDs larger than 2 digits, the Scan Tool assigns a 2 digit module ID to be used in place of the actual CAN module ID. The module ID assigned for the CAN module ID is used in all functions of the Scan Tool.

❒ ISO 14230-4 protocol is shown as K2K (Keyword 2000).



Modules Present

```
ID   Protocols
$10  K2K*
$1A  K2K*
```

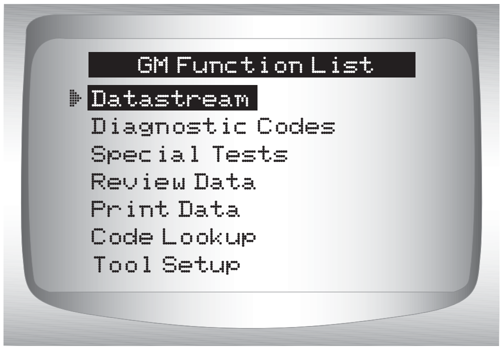
✓ In the above examples, the * indicates the protocol used to communicate to the vehicle’s control module.

GM HISTORIC (OBD I) DIAGNOSTICS

GM Function List

IMPORTANT All items marked with “-” are covered either in section 3 or 4. These items are not covered in this section.

✓ The ***GM Function List*** is broken down into the following menus:



GM Function List
Datastream
Diagnostic Codes
Special Tests
Review Data
Print Data
Code Lookup
Tool Setup

- ☐ **Datastream Menu**
  - ☐ View Data
  - ☐ Record Data
  - – Review Data
  - – Print Data
  - – Tool Setup
- ☐ **Diagnostic Codes Menu**
  - ☐ Read Codes
  - ☐ Erase Codes
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup
- ☐ **Special Tests Menu**
  - ☐ Field Service
  - – Review Data
  - – Print Data
  - – Tool Setup

(List Continued)

- ❒ **Review Data**
- ❒ **Print Data**
  - •Read Codes
  - •Playback

✓ The above stored infromation can be reviewed for GM vehicles. Refer to ***Review Data*** and ***Print Data*** in the **Using the Scan Tool** section of this manual.

- – **Code Lookup**
- – **Tool Setup menu**
  - – English/Metric
  - – Contrast Adjust
  - – Beeper
  - – Setup User Key

✓ Some 1994 and 1995 vehicles use the 16-pin OBD II connector, but are not OBD II compliant. They still use the OBD I application software. Refer to **Appendix B Data Link Connectors**.

✓ If the Scan Tool displays an **Error Message**, make sure the cables and adapters are securely attached and the ignition key is on. Cycle the ignition key to off for 10 seconds, then on. Attempt the test selected again. If the problem remains, refer to **Error Messages** on page 9-2.

Datastream Menu

IMPORTANT All items marked with "-" are covered either in section 3 or 4. These items are not covered in this section.

- ❒ **Datastream Menu**
  - ❒ View Data
  - ❒ Record Data
  - – Review Data
  - – Print Data
  - – Tool Setup

View Data

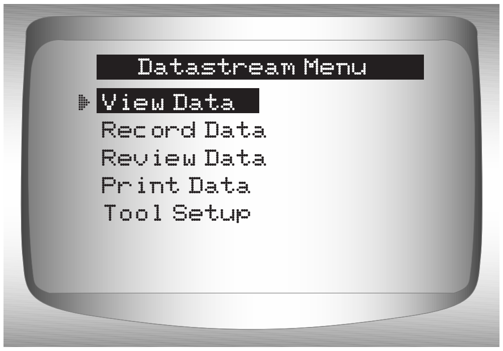
- ✓ The **View Data** function allows the user to view the vehicle parameter identification (PID) data in real time. As the powertrain control module (PCM) monitors PIDs, they are simultaneously transmitted to the Scan Tool. The PIDs are continuously updated at the PCM's rate.
- ✓ In addition to reading codes, **View Data** is the most useful diagnostic function for isolating the cause of a vehicle operation problem. Viewing data is also used for observing sensor data and the ON/OFF state of switches, solenoids, and relays.
- ✓ **View Data** can be performed with key on engine off (KOEO) or key on engine running (KOER).

⚠WARNING **Never operate the Scan Tool while driving. Have another person assist with the operation of the Scan Tool.**

From the ***Datastream Menu:***

1.Select *View Data.*

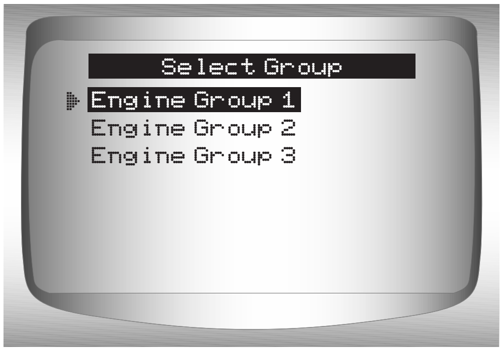
- •Use ▲ **UP** or ▼ **DOWN** arrow key until ***View Data*** is highlighted.
- •Press **ENTER**.


Datastream Menu
View Data
Record Data
Review Data
Print Data
Tool Setup

- ✓ If a ***Select Group*** screen does not appear, skip the Multiple Group section and continue.

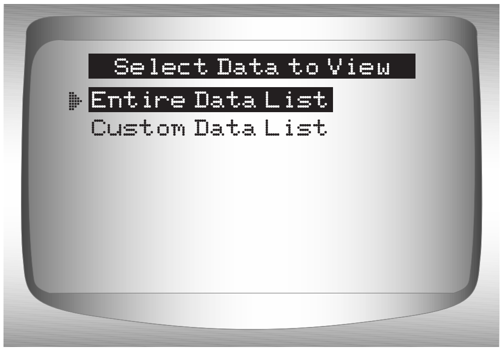
Multiple Group Vehicles

- ✓ Some vehicles display a Select Group screen for viewing data. In these cases, only one group of data can be viewed at a time.


Select Group
Engine Group 1
Engine Group 2
Engine Group 3

2.Select the type of data to view.

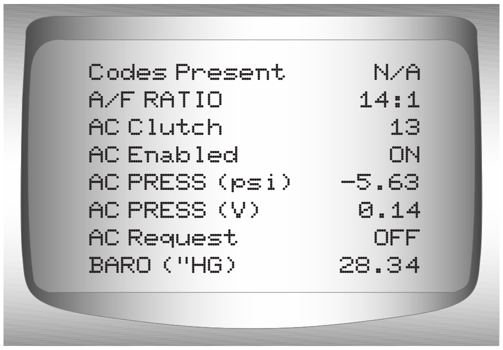
- Use ▲ **UP** or ▼ **DOWN** arrow key to highlight. Refer to ***View Data*** on page 4-4 for Entire or Custom Data Lists.
- Press **ENTER** to establish a communication link.



```
 Select Data to View
▶Entire Data List
 Custom Data List
```

3.View PIDs on Scan Tool.

- Use ▲ **UP** or ▼ **DOWN** arrow keys to scroll through the PIDs.



```
Codes Present        N/A
A/F RATIO           14:1
AC Clutch             13
AC Enabled            ON
AC PRESS (psi)     -5.63
AC PRESS (V)        0.14
AC Request           OFF
BARO ("HG)         28.34
```

4.Change Custom Data List Parameters.

- Press **BACK**.

5.Return to *Datastream Menu*

- Press **BACK**.

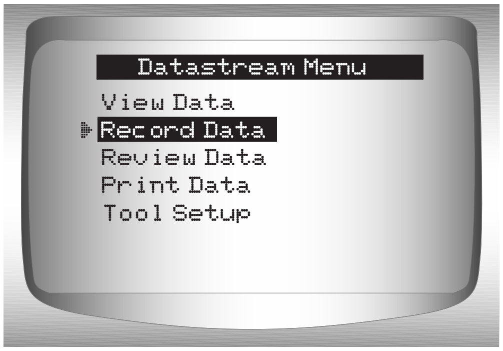
Record Data

✓ The **Record Data** function records vehicle PIDs while the vehicle is parked or being driven. This function is mainly used for diagnosing intermittent driveability problems that cannot be isolated by any other method. The Scan Tool records data based on time (5 frames prior to the start of the recording, and for a duration after). The time after depends on the vehicle data rate. The **Record Data** function allows diagnosis of an intermittent problem by analyzing data leading up to the problem, during the problem, and possibly after the problem, depending on duration.

From the ***Datastream Menu:***

1.Select *Record Data.*

- Use ▲ **UP** or ▼ **DOWN** arrow key until ***Record Data*** is highlight.
- Press **ENTER**.



```
 Datastream Menu
 View Data
▶Record Data
 Review Data
 Print Data
 Tool Setup
```

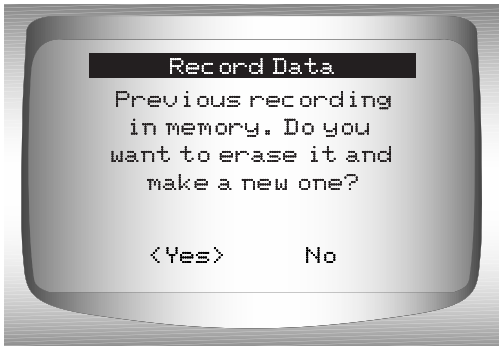
⚠WARNING **Never operate the tool while driving. Have another person assist with the operation of the Scan Tool.**

✓ This function can be performed with KOEO or KOER.

2. Confirm selection.

- Press **LEFT** or **RIGHT** to move the brackets to the desired response.
- Press **ENTER**.

✓ If a recording currently exists in memory, a message to Erase Old Recording is displayed. The Scan Tool stores only one recording at a time, so be sure to review it before erasing it.



Record Data

Previous recording in memory. Do you want to erase it and make a new one?

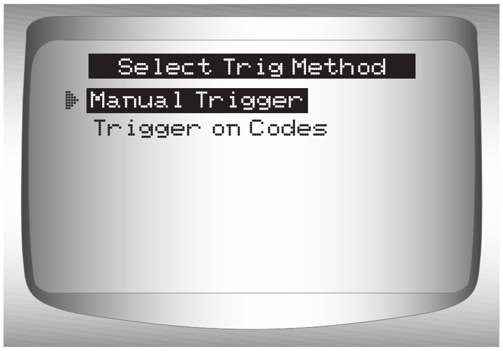
<Yes> No

Multiple Group Vehicles

✓ Some vehicles display a Select Group screen for recording data. In these cases, only one group of data can be recorded at a time. Recording another group of data overwrites the present one.

3. Select Trigger Method.

- Use **UP** or **DOWN** arrow key until desired trigger method is highlighted.
- **Manual Trigger** begins recording when the **ENTER** key is pressed.
- **Trigger on Codes** begins recording when a diagnostic trouble code (DTC) is stored in the PCM.
- Select a method and press **ENTER**.

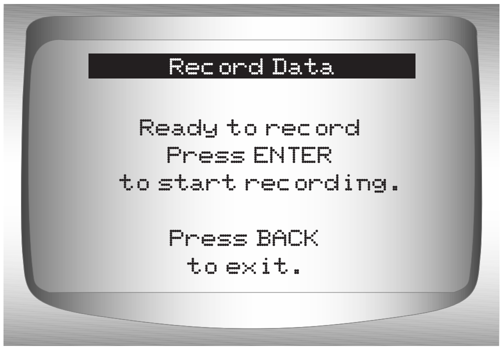


Select Trig Method

Manual Trigger

Trigger on Codes

✓ If **Manual Trigger** is selected, press **ENTER** to begin recording. **Trigger on Codes** will not show this screen.



Record Data

Ready to record
Press ENTER
to start recording.

Press BACK
to exit.

✓ The function runs automatically and stops when the Scan Tool's memory is filled.

4. When done, the Scan Tool prompts you to **Play the Recording?** Select **Yes** to review the data now or **No** to review it later using ***Review Data*.**

5. Return to *Datastream Menu*.

- Press ⏮ **BACK**.

Diagnostic Codes Menu

IMPORTANT All items marked with "-" are covered either in section 3 or 4. These items are not covered in this section.

- ☐ **Diagnostic Codes Menu**
  - ☐ Read Codes
  - ☐ Erase Codes
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup

Read Codes

✓ The **Read Codes** function is used to retrieve all stored DTCs from the control module(s). This can be performed with KOEO or KOER. Two types of codes were used by GM in the Historic System: Current codes and History codes. Prior to 1986, all codes were referred to as Current Codes. From 1986 through 1995, both codes were used because the PCM was able to differentiate between them.

✓ The Scan Tool automatically displays the type of codes that pertain to the vehicle under test. The DTC types are defined as follows:

- ❒ **History Codes** — intermittent codes placed in the vehicle's memory when the trouble originally occurred, and will remain there even if the trouble has been corrected. If no trouble after 50 engine warm-up cycles, the DTC erases.
- ❒ **Current Codes** — codes transmitted through the PCMs data stream when a trouble condition is active and cannot be erased. The problem must be repaired to remove the DTC.

✓ On some vehicles, all codes are Current Codes, because the PCM cannot distinguish Current Codes from History Codes. The only way to determine this is to erase the code and then drive the vehicle to see if the code returns.

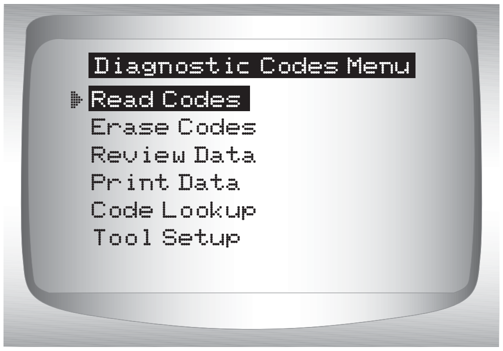
✓ Perform the following:

1) Set parking brake.
2) KOEO or KOER.
3) Put transmission in park (P) or neutral (N).

From the ***Diagnostic Codes Menu:***

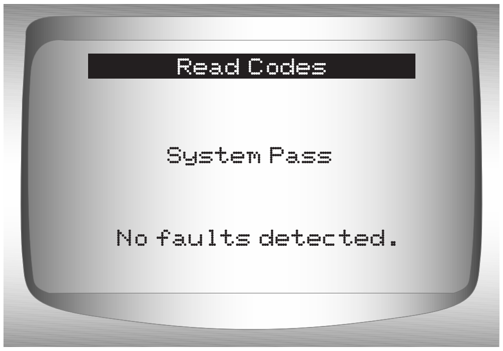
1.Select *Read Codes*.

- •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Read Codes*** is highlighted.
- •Press ENTER **ENTER**.



✓ The Scan Tool retrieves the DTCs.

✓ If no DTCs are present a message stating System Pass: No faults detected is displayed.



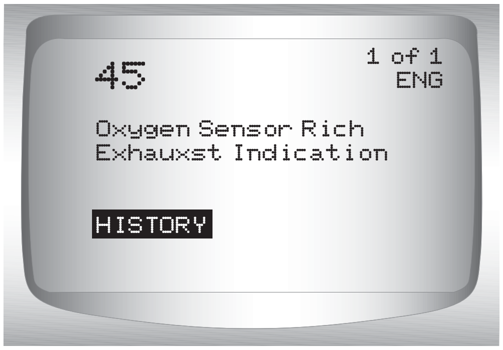
Read Codes

System Pass

No faults detected.

2. **View and write down DTCs.**

- Use ▲ **UP** or ▼ **DOWN** arrow keys.



1 of 1
ENG

45

Oxygen Sensor Rich
Exhauxst Indication

HISTORY

3. **Return to *Diagnostic Codes Menu*.**

- Press ⏮ **BACK**.

Erase Codes

✓ The **Erase Codes** function deletes the DTCs from the vehicle's computer memory. Perform this function with KOEO or KOER. This function should be performed only after the systems have been checked completely and DTCs have been documented.

✓ After servicing the vehicle, erase the stored DTCs, perform a road test, and then verify no new codes have been stored. If DTCs return, the problem has not been corrected or other faults are present.

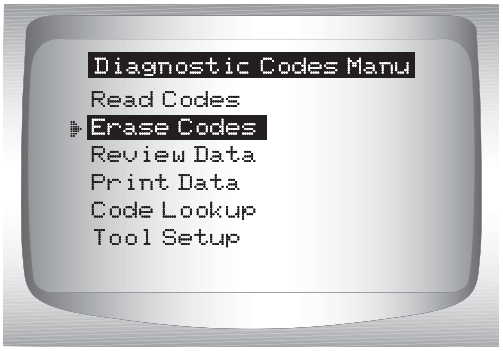
✓ Some codes can only be removed by repairing the faults that caused them. Therefore, these codes remain in the vehicle's memory until the condition is repaired.

✓ Not all trouble codes can be automatically erased using the Scan Tool. Some vehicles require a manual erasing procedure. If possible, the Scan Tool performs the appropriate **Erase Codes** procedure for your vehicle.

From the ***Diagnostic Codes Menu***:

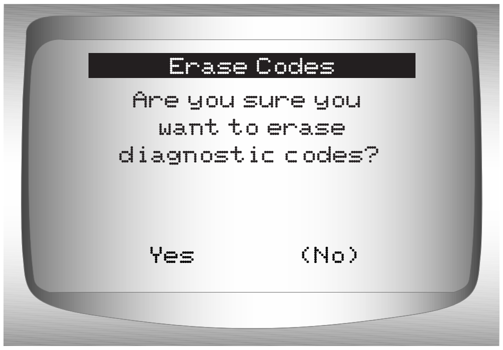
1.Select *Erase Codes*.

- Use ▲ **UP** or ▼ **DOWN** arrow key until ***Erase Codes*** is highlighted.
- Press **ENTER**.


Diagnostic Codes Manu
Read Codes
Erase Codes
Review Data
Print Data
Code Lookup
Tool Setup

2.Confirm selection.

- Press ◀ **LEFT** or ▶ **RIGHT** to move the brackets to the desired response.
- Press **ENTER**.


Erase Codes

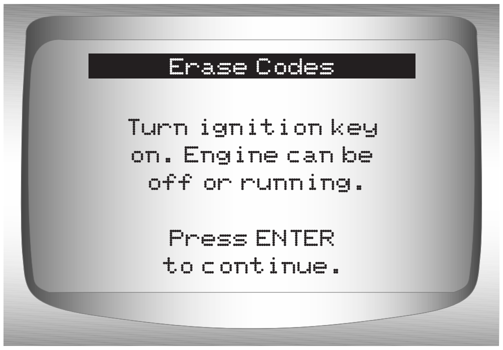
Are you sure you want to erase diagnostic codes?

Yes
(No)

✓ Selecting **No** and pressing **ENTER** returns you to the ***Diagnostic Codes Menu***.

✓ Selecting **Yes** displays a screen prompting you to turn ignition on.

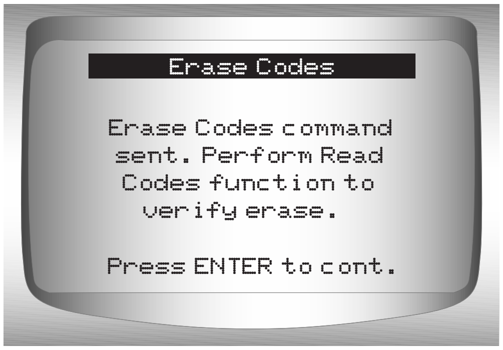
- Turn ignition key on. Engine can be off or running.
- Press **ENTER** to continue.


Erase Codes

Turn ignition key on. Engine can be off or running.

Press ENTER to continue.

✓ A message confirming that the **Erase Codes** command was successful displays.


Erase Codes

Erase Codes command sent. Perform Read Codes function to verify erase.

Press ENTER to cont.

3.Return to *Diagnostic Codes Menu*.

- Press **ENTER**.

Manual Erase Methods

Alternate Method 1:

1) Turn ignition key off.
2) Locate fuse box and remove ECM fuse.
3) Wait 20 seconds.
4) Replace the fuse.

Alternate Method 2:

1) Turn ignition key off.
2) Remove power from Scan Tool.
3) Disconnect Scan Tool from vehicle.
4) Disconnect negative (-) battery cable. Wait 30 seconds, then replace the cable.

✓ The computer has a learning ability to compensate for minor variations in engine operation. Whenever power is removed from the PCM, the computer must relearn various functions. Vehicle performance may be noticeably different until this is accomplished. This is a temporary situation and is normal. The learning process takes place during warm engine driving.

Special Tests Menu

IMPORTANT All items marked with "-" are covered either in section 3 or 4. These items are not covered in this section.

❒ **Special Tests Menu**
  ❒ Field Service
  – Review Data
  – Print Data
  – Tool Setup

Field Service

✓ **Field Service** is a special diagnostic mode to monitor fuel system operation and read DTCs. Some GM service manuals may refer to this mode as the Field Service Mode Check. This mode works on vehicles equipped with a 12-pin ALDL connector with a wire present in pin-B, Diagnostic or Test Enable. The Scan Tool enters this mode by grounding pin-B: shorting pin-B to pin -A (ground).

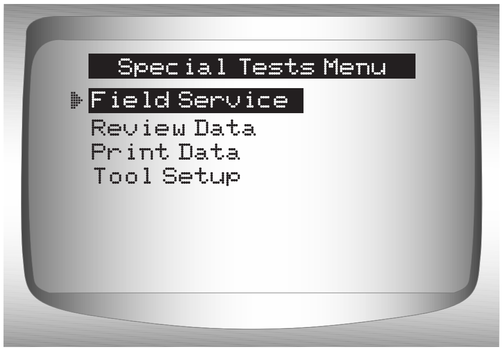
✓ **Field Service** mode can be operated with KOEO or KOER.

✓ Vehicles equipped with climate control computers do not use Field Service mode.

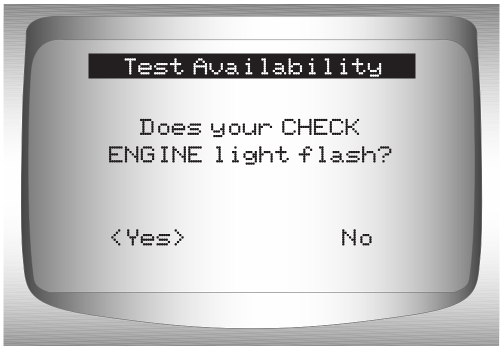
✓ Some 1994 and 1995 vehicles equipped with a 12-pin ALDL connector with pins A and B shorted will not cause the CHECK ENGINE light to flash codes.

From the ***Special Tests Menu:***

1. **Select *Field Service.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Field Service*** is highlighted.
   - •Press ENTER **ENTER**.



2. **Check vehicle malfunction indicator lamp (MIL).**
   - •Turn ignition key on, but do not start engine. The CHECK ENGINE light should flash.
   - •Select **YES** to continue.
   - •If the light does not illuminate, either the vehicle does not support this test mode, the lamp is burned-out or circuit problems exist.

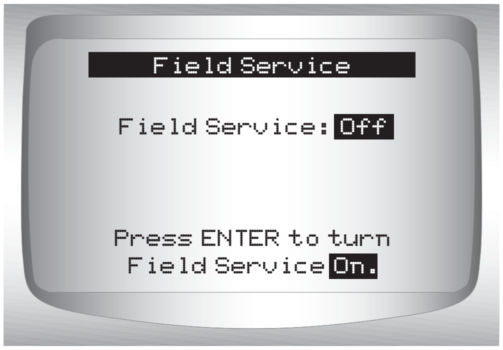


Does your CHECK ENGINE light flash?

✓ It is difficult to know exactly which GM vehicles use the Field Service mode. It is possible to have the Field Service mode function on the ***Special Tests Menu***, and it not be applicable.

✓ If CHECK ENGINE light is functional, the ***Field Service*** screen is displayed. Pressing **ENTER** will toggle the short to **Pins A and B On** and **Off**.

✓ Continue with either the **KOEO** procedure or **KOER** procedure.



Field Service

Field Service: Off

Press ENTER to turn Field Service On.

✓ While in **Field Service** mode, no new DTCs are stored in the vehicle's memory.

KOEO Procedure

✓ In the KOEO Procedure, Field Service can check relays, solenoids and the idle speed motor, and obtain DTCs using the CHECK ENGINE light.

1) Turn ignition key on but do not start engine.
2) On Scan Tool, place Field Service On.
3) The CHECK ENGINE light begins to flash codes. Each DTC is displayed three (3) times. The DTCs are displayed starting with the lowest numbered one. After all DTCs are displayed, the sequence keeps repeating until the ignition key or Field Service mode is turned OFF.

☐ Count the number of times the CHECK ENGINE light flashes to obtain DTCs. The first digit is sent first. A short pause separates digits while a long pause separates each DTC. All codes contain 2 digits.

☐ DTC 12 (No RPM reference pulse) should display first since the engine is not running. If not, problems exist in the PCM or CHECK ENGINE light circuitry.

Code 12 will look like:

FLASH-pause-FLASH-FLASH — long pause.

Code 23 will look like:

FLASH-FLASH-pause-FLASH-FLASH-FLASH — long pause.

4) When Field Service mode is on, most computer controlled relays and solenoids will be turned on, except for the fuel pump relay and fuel injectors. Toggle the Field Service mode on and off.
   - ❒ Use a voltmeter to measure relays and solenoids input voltage to verify on/off conditions. An ohmmeter could be used to check the continuity between the relay's switch terminals.
   - ❒ The idle air control (IAC) valve is fully seated to the zero position by the PCM.
   - ❒ The exhaust gas recirculation (EGR) solenoid is energized for 25 seconds.

KOER Procedure

✓ With the engine running, the *Field Service* mode can be used to measure base timing, check open loop/closed loop operation, and determine if the engine is running rich or lean.

1)Engage parking brake and block drive wheels.

2) Verify engine is cold. If engine is hot or warm, allow it to cool.

3) On Scan Tool, place Field Service on.

4) Start engine and place transmission in Park or Neutral. The CHECK ENGINE light will flash once.

5) Warm the engine by idling for 2 minutes at 2000 RPM.

6) Observe CHECK ENGINE light.
   - •If CHECK ENGINE light flashes 2.5 times a second, the on-board computer is operating in Open Loop.
   - •When the engine warms up to normal operating temperature, the on-board computer is now operating in Closed Loop. The CHECK ENGINE light should flash once a second. The on-board computer is now operating in Closed Loop.
   - •If CHECK ENGINE light:
     - ❒ flashes equally on/off, then the fuel system is running normally.
     - ❒ is mostly on, then the fuel system is running rich.
     - ❒ is mostly off, then the fuel system is running lean.

7) On some engines, the spark advance timing is fixed during Field Service mode. This allows the technician to measure the engine base timing.

3. Return to *Special Tests Menu.*

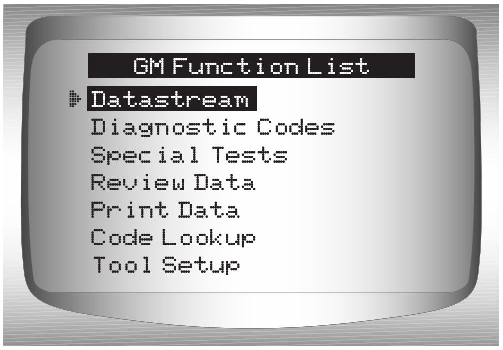
•Press ⏮ **BACK**.

GM ENHANCED (OBD II) DIAGNOSTICS

GM Function List

IMPORTANT All items marked with “-” are covered either in section 3 or 4. These items are not covered in this section.

✓ The ***GM Function List*** is broken down into the following menus:



GM Function List
▶ Datastream
Diagnostic Codes
Special Tests
Review Data
Print Data
Code Lookup
Tool Setup

- ❒ **Datastream Menu**
  - – View Data
  - – Record Data
  - – Review Data
  - – Print Data
  - – Tool Setup
- ❒ **Diagnostic Codes Menu**
  - ❒ Read Codes
  - – Pending Codes
  - ❒ Erase Codes
  - – View Freeze Data
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup
- – **Special Tests Menu**
  - – I/M Readiness
  - – Drive Cycle Monitor
  - – State OBD Check
  - – O2 Monitor Test
  - – Diagnostic Monitor Test
  - – On-Board Systems
  - – Vehicle Information
  - – Modules Present
  - – Review Data
  - – Print Data
  - – Tool Setup

(List Continued)

❒ **Review Data**
❒ **Print Data**
- •I/M Readiness
- •DTC (Codes)
- •Pending Codes
- •Freeze Frame
- •O2 Monitor Test
- •Diagnostic Monitor Tests
- •Vehicle Info
- •Playback
- •State OBD Check
- •Modules Present

✓ The following stored infromation can be reviewed for GM vehicles. Refer to ***Review Data*** and ***Print Data*** in the **Using the Scan Tool** section of this manual.

- **Code Lookup**
- **Tool Setup menu**
  - English/Metric
  - Contrast Adjust
  - Beeper
  - Setup User Key

IMPORTANT This system applies to GM vehicles manufactured from 1996 to present. Some GM vehicles in 1994 and 1995 were equipped with this system. Refer to **Appendix B - Data Link Connectors**.

✓ If an **Error Message** displays, make sure the OBD II connector is securely attached, and the ignition key is on. Cycle the ignition key to off for 10 seconds, then on. This may be required to reset the computer. If required, select yes to try again. If the problem still exists, refer to **Error Messages** on page 8-2.

Diagnostic Codes Menu

IMPORTANT All items marked with "-" are covered either in section 3 or 4. These items are not covered in this section.

❒ **Diagnostic Codes Menu**
  ❒ Read Codes
  – Pending Codes
  ❒ Erase Codes
  – View Freeze Data
  – Review Data
  – Print Data
  – Code Lookup
  – Tool Setup

Read Codes

✓ The **Read Codes** function retrieves DTCs from the vehicle's computer module(s). This function can be performed with the KOEO or KOER. These codes cause the computer to illuminate the malfunction indicator lamp (MIL) when an emission-related or driveability fault occurs. The MIL is also known as the service engine soon or check engine lamp.

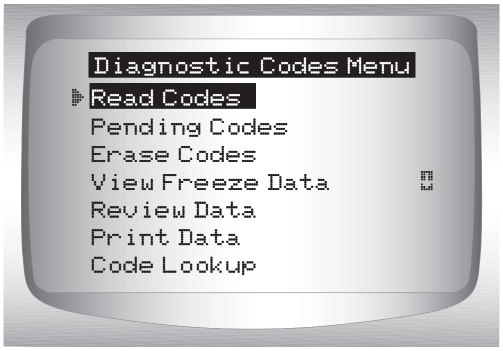
✓ The GM Enhanced reads DTC's from the engine or powertrain module (ENG), transmission module (TRANS), or transfer case module (XFER).

✓ Not all GM vehicles support DTC status. Some only use the Global OBDII Read Codes command. For a description of these screens, refer to the **Global OBD II Diagnostics** section of the manual.

- **History Codes** — Intermittent codes placed in the vehicle's memory when the trouble originally occurred, and will remain there even if the trouble has been corrected. If no trouble after 50 engine warm-up cycles, the DTC will be erased.
- **Current Codes** — Codes transmitted through the PCMs data stream when a trouble condition is active and cannot be erased. The problem must be repaired to remove the DTC.
- **Intermittent Codes** — Indicates the current code has been set at least once but possibly not enough to cause a history code to be stored.

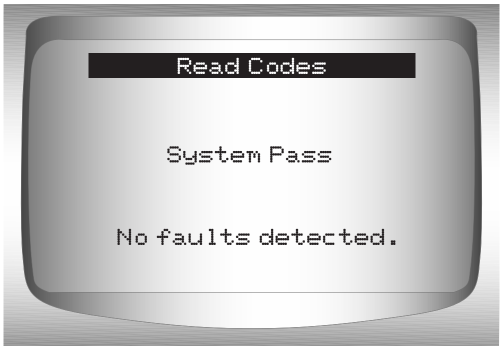
From the ***Diagnostic Codes Menu***:

1. **Select *Read Codes*.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***Read Codes*** is highlighted.
   - Press **ENTER.**


Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

✓ If no DTCs are present a message stating System Pass: No faults detected is displayed.

2. **View and write down the DTCs.**
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys.

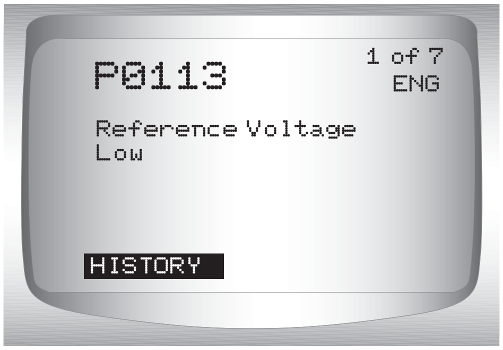


Read Codes

System Pass

No faults detected.

❒ On some GM vehicles the Scan Tool shows current and history DTC status. Some GM vehicles also show intermittent codes.



P0113

1 of 7
ENG

Reference Voltage
Low

HISTORY

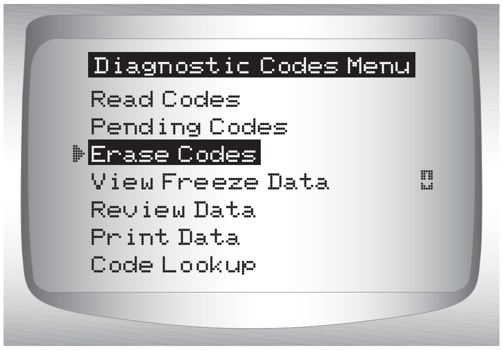
3. **Return to *Diagnostic Codes Menu.***
   - Press **BACK**.

Erase Codes

✓ The Erase Codes menu has a menu asking what module to erase codes for, if more than one module exists for this vehicle.

From the ***Diagnostic Codes Menu:***

1. **Select *Erase Codes.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Erase Codes*** is highlighted.
   - •Press **ENTER**.



Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

✓ Select a subsystem from which you would like to erase codes from.

✓ Confirm your selection. Press **ENTER** to continue.

2. **Return to *Diagnostic Codes Menu.***
   - •Press **ENTER.**

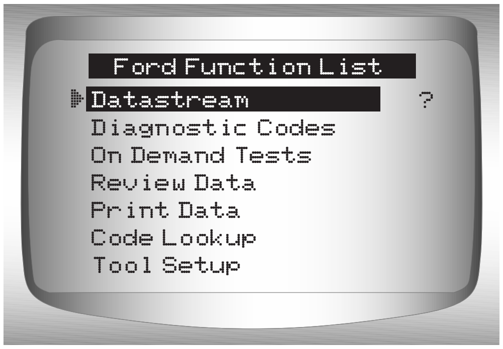
Section 6 – Ford Diagnostics

Ford Historic (OBD I) Diagnostics

✓ Due to different processor calibrations, all Ford Function Lists for a particular vehicle may or may not appear as shown. Based on the vehicle information entered at the ***Vehicle Selection*** menu, the Scan Tool automatically recognizes the computer system installed.

Ford Function List

IMPORTANT All items marked with "-" are covered in section 3 or 4. These items are not covered in this section.


Ford Function List
Datastream ?
Diagnostic Codes
On Demand Tests
Review Data
Print Data
Code Lookup
Tool Setup

✓ The ***Ford Function List*** is broken down into the following menus:

- ❒ **Datastream Menu**
  - ❒ View Data
  - ❒ Record Data
  - – Review Data
  - – Print Data
  - – Tool Setup
- ❒ **Diagnostic Codes Menu**
  - ❒ Read KOEO Codes
  - ❒ Read KOER Codes
  - ❒ Erase Codes
  - ❒ IVSC Speed Ctrl
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup
- ❒ **On Demand Test Menu**
  - ❒ Wiggle Test
  - ❒ Output Switch Test
  - ❒ Cyl Balance Test
  - ❒ STAR Test Mode
  - – Review Data
  - – Print Data
  - – Tool Setup

(List Continued)

❐ **Review Data**

❐ **Print Data**

  - KOEO Codes
  - KOER Codes
  - IVSC KOEO Codes
  - IVSC KOER Codes
  - Playback

✓ For Ford Historic diagnostics, the above functions have data to review or print. For *Review/Print Data* instructions, refer to appropriate page in **Using The Scan Tool.**

- **Code Lookup**
- **Tool Setup Menu**
  - English/Metric
  - Contrast Adjust
  - Beeper
  - Setup User Key

IMPORTANT If the function is not supported by the vehicle, then the Scan Tool does not display it.

✓ Most Ford vehicles prior to 1996 use the EEC-IV system. Vehicles with Mazda-sourced engines use the Mazda Electronic Control System (MECS). Refer to "**Appendix B - Data Link Connectors**".

✓ If the Scan Tool displays an **Error Message**, make sure the adapter cable is securely attached and the ignition key is on. Cycle the ignition key to off for 10 seconds, thenon. This may be required because the Ford system allows only one Self-Test function to be performed for each key on. Attempt the test selected again and if the problem remains, refer to "**Error Messages**" on page 9-2.

Datastream Menu

IMPORTANT All items marked with "-" are covered either in section 3 or 4. These items are not covered in this section.

- ☐ **Datastream Menu**
  - ☐ View Data
  - ☐ Record Data
  - – Review Data
  - – Print Data
  - – Tool Setup

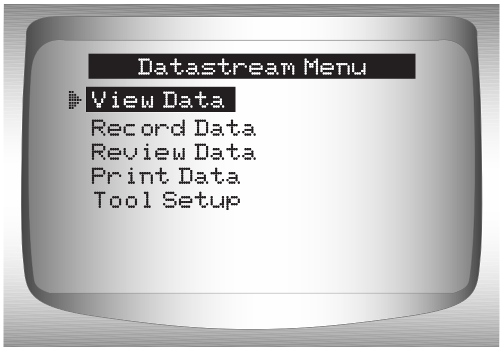
✓ **Datastream Menu** functions are used to view and record engine data transmitted from the vehicle on EEC-IV vehicles beginning in 1990. These functions allow viewing of data parameters in real time to pinpoint problems when they occur. The Scan Tool also has the ability to record these data parameters as the vehicle is operated to locate intermittent problems.

View Data

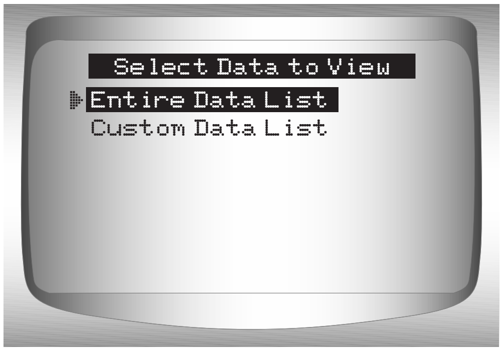
✓ The **View Data** function allows the mechanic to view Parameter Identification Numbers (PIDs) in real time. Simply stated, as the powertrain control module (PCM) monitors the vehicle's PIDs, they are simultaneously transmitted to the Scan Tool. Viewing data is also used for observing sensor data and the on/off state of switches, solenoids, and relays.

From the ***Datastream Menu:***

1. **Select *View Data*.**
   - •Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***View Data*** is highlighted.
   - •Press ENTER **ENTER**.



2. ***Select data to view.***
   - See View Data on page 4-4 of Global OBD II Diagnostics for Entire or Custom Data Lists.
   - Press **ENTER**.


Select Data to View
Entire Data List
Custom Data List

3. **View PIDs on Scan Tool.**
   - Use the **UP** or **DOWN** arrow key.

4. **Return to *Datastream Menu.***
   - Press **BACK**.

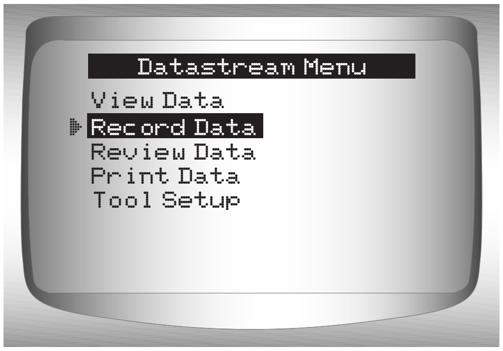
Record Data

✓ The **Record Data** function is used to record vehicle data parameters over time. The **Record Data** function allows diagnosis of an intermittent problem by analyzing data leading up to the problem, during the problem, and possibly after the problem, depending on duration. This function is used if no other diagnostic method works.

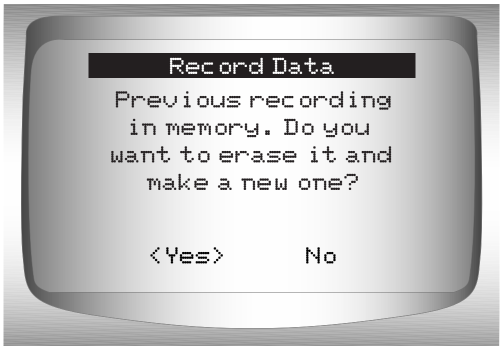
✓ The Scan Tool records data based on time (5 frames prior to the trigger point, and for a duration after). The time after depends on the vehicle data rate.

From the ***Datastream Menu:***

1. **Select *Record Data.***
   - Use the **UP** or **DOWN** arrow keys until ***Record Data*** is highlighted.
   - Press **ENTER**.


Datastream Menu
View Data
Record Data
Review Data
Print Data
Tool Setup

- ✓ If a recording currently exists in memory, a message to ERASE OLD RECORDING displays.



Record Data

Previous recording in memory. Do you want to erase it and make a new one?

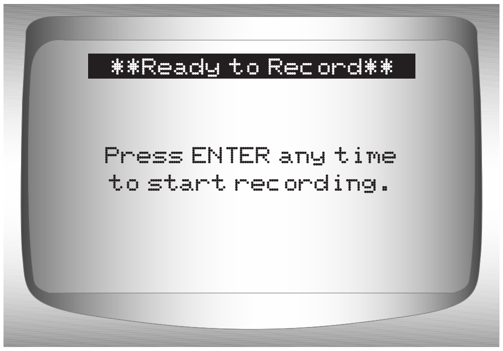
<Yes> No

- ✓ The Scan Tool maintains only one recording at a time, so be sure to thoroughly review an old recording before erasing it. Power to store recordings is provided by the Scan Tool's internal battery, thus, recordings are stored in memory only for the life of the battery.

- ✓ Once the communication link has been established, you are ready to record data.

⚠CAUTION **Never operate the Scan Tool while driving. Have another person assist with the operation of the Scan Tool.**

2. **Start recording.**
   - Recording starts when the ENTER **ENTER** key is pressed.

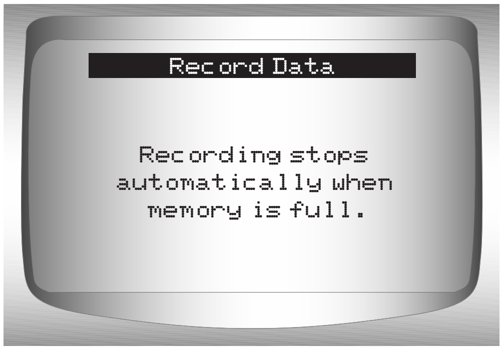


Ready to Record

Press ENTER any time to start recording.

- ✓ The Scan Tool records for a varying time duration. The recording consists of 5 frames of data prior to the trigger point, and approximately 20 seconds after the recording. All applicable data parameters are recorded for the vehicle.

When the recording is in progress, the screen to the right is displayed.


Record Data

Recording stops automatically when memory is full.

3. **After recording, Scan Tool displays a prompt to Playback Data.**
   - Answer **NO** to return to the ***Datastream Menu***.
   - Answer **YES** to display recorded data.

Refer to "**Playback**" on page 3-19 of **Using The Scan Tool**.

Diagnostic Codes Menu

IMPORTANT All items marked with "-" are covered either in section 3 or 4. These items are not covered in this section.

❒ **Diagnostic Codes Menu**
  ❒ Read KOEO Codes
  ❒ Read KOER Codes
  ❒ Erase Codes
  ❒ IVSC Speed Ctrl
  – Review Data
  – Print Data
  – Code Lookup
  – Tool Setup

Read KOEO Codes

✓ The **Read KOEO Codes** function activates the KOEO and Continuous Memory self-tests which retrieve KOEO and continuous memory diagnostic trouble codes (DTCs) from the PCM.

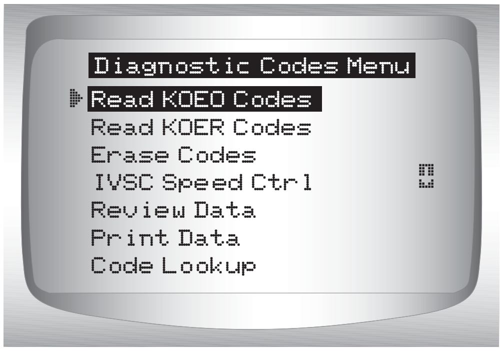
- **KOEO DTCs** are transmitted through the PCM data link when a trouble condition is active. KOEO codes remain until the trouble condition becomes inactive – usually when the fault is repaired.
- **Continuous Memory DTCs** are stored in the vehicle's memory at the time of occurrence during continuous self-test monitoring. They remain there until the problem does not reoccur within 40 warm-up cycles, Fast KOEO codes have been read, or the Erase Codes function has been run. Continuous memory codes follow the KOEO codes in the datastream.

✓ The DTCs are transmitted in two formats; both transmit the same information:

- **Slow Codes** are regular service codes that allow the user to identify the faults with an analog voltmeter or the check engine light. Slow Codes are transmitted within 3 minutes.
- **Fast Codes** are transmitted within seconds and must be read with a diagnostic tool. Retrieving Fast Codes erases continuous memory codes, Slow Codes does not. **Fast Codes** do not apply to MECS vehicles.

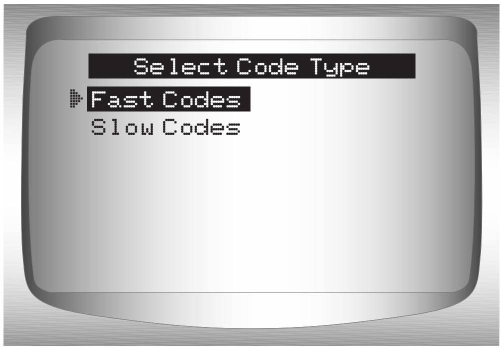
From the ***Diagnostic Codes Menu***:

1. **Select *Read KOEO Codes*.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***Read KOEO Codes*** is highlighted.
   - Press ENTER **ENTER**.



Diagnostic Codes Menu
Read KOEO Codes
Read KOER Codes
Erase Codes
IVSC Speed Ctrl
Review Data
Print Data
Code Lookup

2. **Select *Fast Codes* or *Slow Codes*.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key until selection is highlighted.
   - Press ENTER **ENTER**.



Select Code Type
Fast Codes
Slow Codes

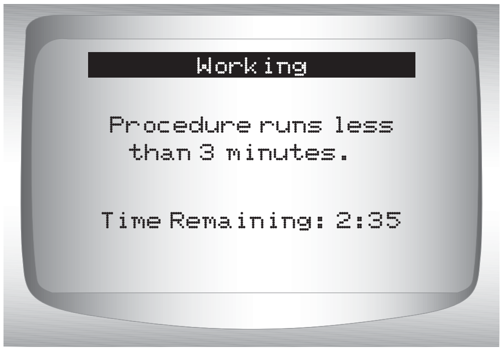
✓ Follow the instructions step-by-step.

1) Set parking brake.
2) Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Start engine and let idle until hot.
5) Turn ignition key off.
6) Wait 10 seconds. Turn key on-engine off. **Do not start engine**.

⚠CAUTION **Avoid cooling fan! It may turn on during test.**

✓ While waiting for the codes to transmit, the PCM cycles the following system components on and off:

- Electric radiator cooling fan
- Fuel pump
- Check engine light or malfunction indicator light (MIL) – Slow Codes only.
- Idle speed control solenoid



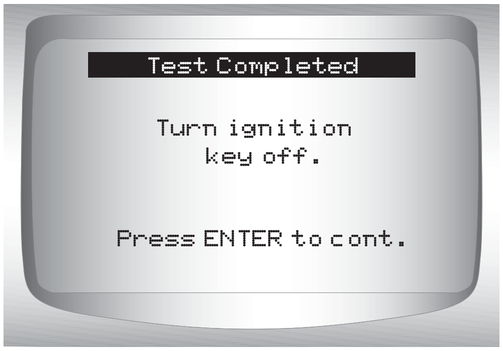
Working

Procedure runs less than 3 minutes.

Time Remaining: 2:35

3. When the test is complete.

•Turn ignition key off.
•Press **ENTER**.

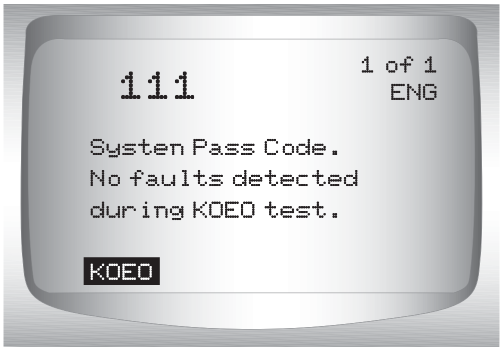


Test Completed

Turn ignition key off.

Press ENTER to cont.

✓ If no problems exist, Code 11 or 111 will be displayed.



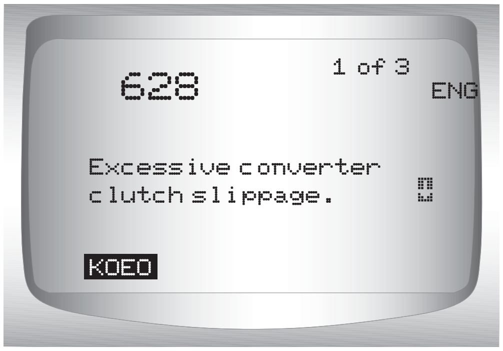
111 1 of 1
ENG

Systen Pass Code.
No faults detected
during KOEO test.

KOEO

4. **View and write down DTCs.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key.

✓ ENG indicates that DTC is from the engine or powertrain control module.



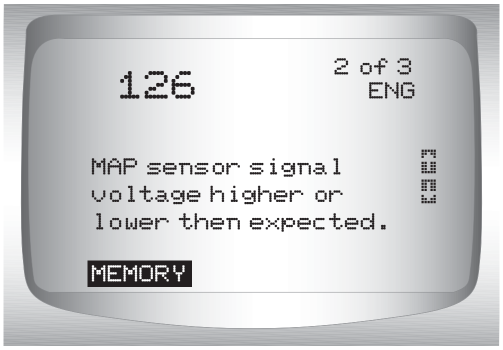
628 1 of 3 ENG

Excessive converter clutch slippage.

KOEO

✓ After viewing and noting the KOEO codes, use the ▼ **DOWN** arrow key to view continuous memory codes.

✓ Continuous memory codes (codes set previously under normal driving conditions) are available after reading KOEO codes. They are indicated as Memory Codes by the Scan Tool.



126 2 of 3 ENG

MAP sensor signal voltage higher or lower then expected.

MEMORY

5. **Return to *Diagnostic Codes Menu.***
   - •Press ⏪ **BACK**.

Read KOER Codes

✓ The **Read KOER Codes** function activates the KOER self-test which retrieves KOER DTCs that are present when the engine is running.When the trouble condition is inactive, the KOER code is no longer sent through the data stream. This function also performs a **Computed Timing Check** for EEC-IV vehicles manufactured from 1984 through 1991.

✓ The DTCs are transmitted in two formats which transmit the same information:

- **Slow Codes** are regular service codes that allow the user to identify the faults with an analog voltmeter or the check engine light. Slow Codes are transmitted within 3 minutes.
- **Fast Codes** are transmitted within seconds and must be read with a diagnostic tool. MECS vehicles do not support Fast Codes.

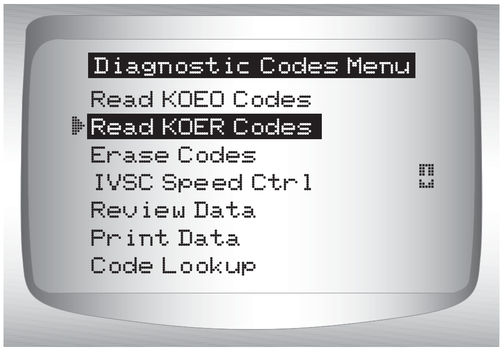
⚠WARNING **Exhaust gases are harmful or lethal. Always operate vehicle in a well-ventilated area.**

⚠CAUTION **The KOER test is done with the engine running. Do not over-rev engine. Observe all safety precautions.**

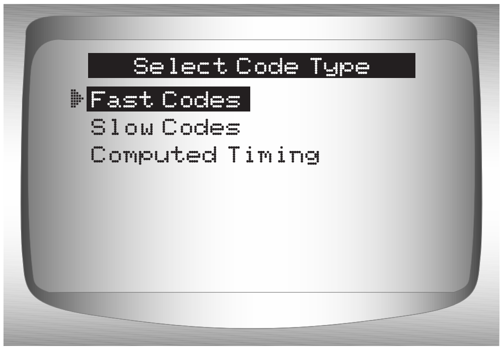
⚠CAUTION **Avoid cooling fan! It may turn on during test.**

From the ***Diagnostic Codes Menu:***

1. **Select *Read KOER Codes***
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***Read KOER Codes*** is highlighted.
   - •Press **ENTER**.


Diagnostic Codes Menu
Read KOEO Codes
Read KOER Codes
Erase Codes
IVSC Speed Ctrl
Review Data
Print Data
Code Lookup

2. **Select *Fast Codes*, *Slow Codes* or *Computed Timing*.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key until desired chioce is highlighted.
   - •Press **ENTER.**


Select Code Type
Fast Codes
Slow Codes
Computed Timing

✓ Follow the instructions step-by-step. Failure to perform these steps may set a false DTC in the PCM — observe the display.

1) Set parking brake.
2) Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Start engine and let idle until hot.
5) Turn ignition key off.
6) Wait 10 seconds. Start engine and let idle.
7) If vehicle is equipped with a manual transmission, release clutch.

3. **After performing steps.**
   - •Press **ENTER** to activate the self-test.

✓ The following actions do not apply to MECS vehicles.

- ❒ For a 7.3L Diesel, press the throttle until test is done.
- ❒ If applicable, set octane switch to premium.

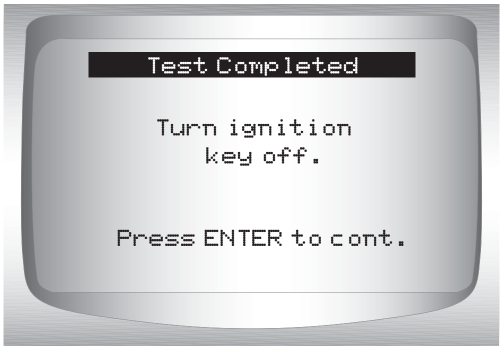
✓ The Scan Tool prompt the user to:

- ❒ Work steering wheel
- ❒ Pump brake pedal & cycle overdrive (OD) cancel switch. (Cycle overdrive only if a pushbutton is available.)

✓ Observe screen for the prompt to perform the next action.

- ❒ Quickly press and release the throttle. **One time only!**

4. **When test completed.**
   - Turn ignition key off.
   - Press **ENTER** to continue.

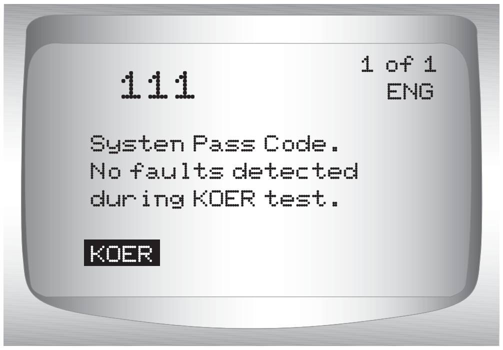


Test Completed

Turn ignition
key off.

Press ENTER to cont.

✓ If no problems exist, Code 11 or 111 will be displayed.



111

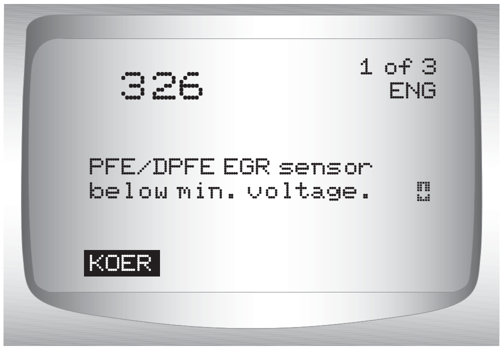
1 of 1
ENG

Systen Pass Code.
No faults detected
during KOER test.

KOER

5. **View and write down DTCs.**
   - Use **UP** or **DOWN** arrow key to scroll to next DTC.

✓ ENG indicates that DTC is from the engine or powertrain control module.



326

1 of 3
ENG

PFE/DPFE EGR sensor
below min. voltage.

KOER

6. **Return to *Diagnostic Codes Menu.***
   - Press **BACK**.

Computed Timing Check (1984-1991 EEC-IV Vehicles)

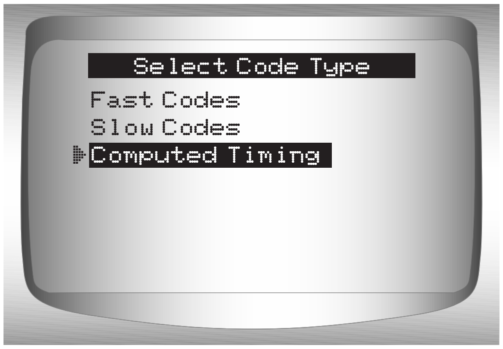
✓ This option of the **KOER Read Codes** function allows you to check both the Base engine timing (no computer adjustment) and the ability of the computer to control spark advance.

✓ This does not apply to 7.3L diesel vehicles.

✓ Connect a timing light to the vehicle in accordance with the manufacturer's instructions. (For 2.3L dual plug engines, use exhaust side plug. Refer to ignition system section in the service manual for specific instructions.)

From the ***Select Code Type*** menu:

1. **Select *Computed Timing.***
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***Computed Timing*** is highlighted.
   - Press **ENTER**.

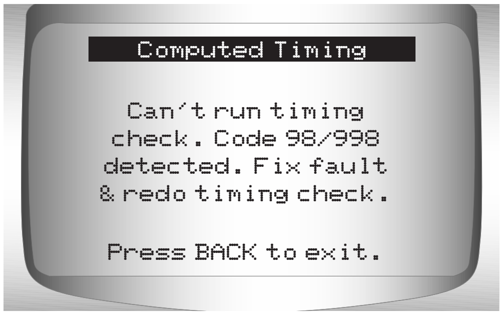


✓ Perform the following step-by-step. Failure to perform these steps may set a false DTC in the PCM — observe the display.

CAUTION **Avoid cooling fan! It may turn on during test.**

1) Set parking brake.
2) Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Start engine and let idle until hot.
5) Turn ignition key off.
6) Wait 10 seconds. start engine and let Idle.
7) If vehicle is equipped with manual transmission, release clutch.

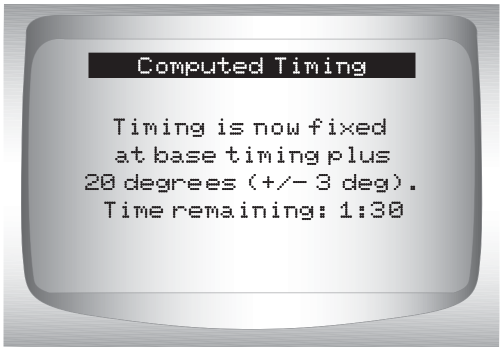
✓ If a KOER code of 98 or 998 is detected, then the fault must be fixed before performing this function. Press the **BACK** key to return to the ***Diagnostic Codes Menu***.


Computed Timing

Can't run timing check. Code 98/998 detected. Fix fault & redo timing check.

Press BACK to exit.

✓ Otherwise, the timing remains fixed for 90 seconds to allow you to measure it with the timing light.


Computed Timing

Timing is now fixed at base timing plus 20 degrees (+/- 3 deg). Time remaining: 1:30

✓ Computed timing is equal to the base timing plus 20 degrees before top dead center (BTDC) with 3 degrees tolerance. The base timing value is printed on the vehicle emission control information (VECI) decal.

2. **Return to *Diagnostic Codes Menu.***
   - •Press **ENTER** .

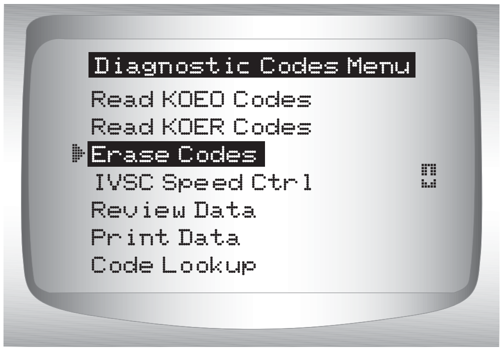
Erase Codes

✓ The service manual may recommend erasing Continuous Memory Codes from the vehicle's memory, and then driving the vehicle to duplicate the malfunction before beginning a diagnostic test. If KOEO codes were read using Fast Codes, the memory codes have already been erased.

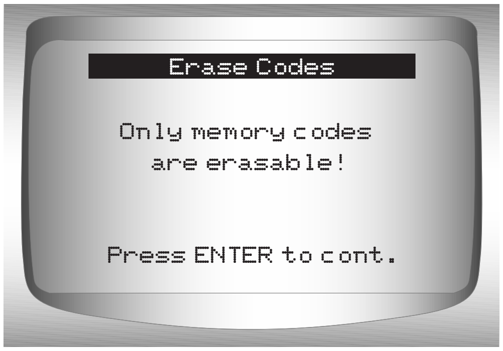
EEC-IV Erase Codes

From the ***Diagnostic Codes Menu***:

1. **Select *Erase Codes.***
   - •Use the **UP** or **DOWN** arrow keys until ***Erase Codes*** is highlighted.
   - •Press **ENTER.**



✓ Only continuous memory codes can be erased from the vehicle without repairing the fault. To remove KOEO and KOER codes, the fault must be repaired since they only exist when a fault exists.



Erase Codes

Only memory codes are erasable!

Press ENTER to cont.

2. **Perform the following:**

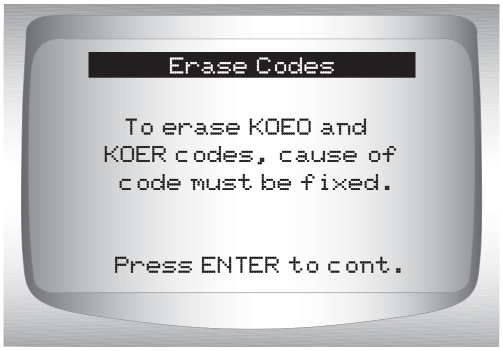
1) Turn ignition key off.

2) Transmission in park (P)or neutral (N).

3) Wait 10 seconds.

4) Turn ignition key on.

- Press **ENTER** after each message.

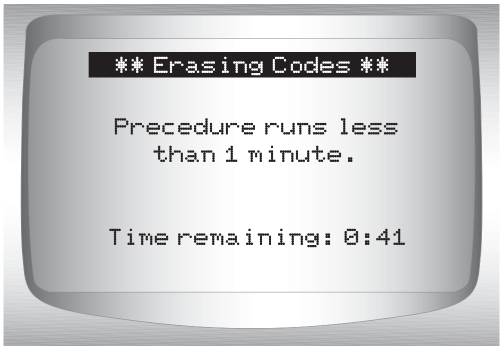


Erase Codes

To erase KOEO and KOER codes, cause of code must be fixed.

Press ENTER to cont.

3. **Erase Memory Codes.**
   - Press **ENTER** to begin erasing the codes.
   - The procedure takes less 1 minute to run.



** Erasing Codes **

Precedure runs less than 1 minute.

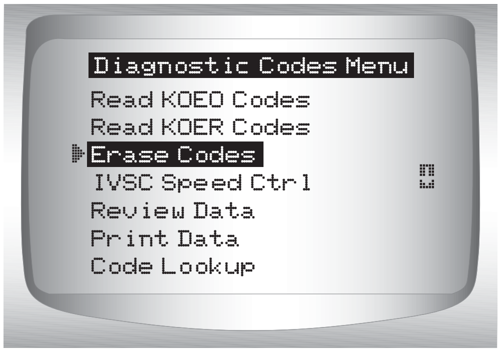
Time remaining: 0:41

4. **Return to the *Diagnostic Codes Menu*.**
   - Press **BACK**.

MECS Erase Codes

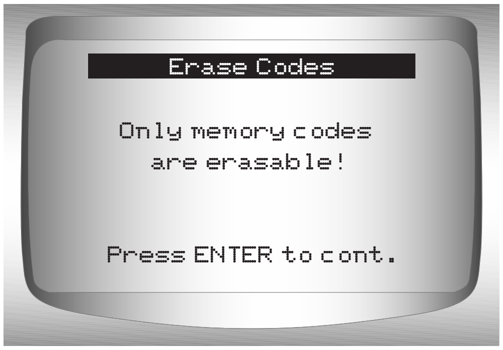
From the ***Diagnostic Codes Menu***:.

1. **Select *Erase Codes*.**
   - Use the ▲**UP** or ▼**DOWN** arrow keys until ***Erase Codes*** is highlighted.
   - Press **ENTER**.


Diagnostic Codes Menu
Read KOEO Codes
Read KOER Codes
Erase Codes
IVSC Speed Ctrl
Review Data
Print Data
Code Lookup

2. **Follow all instructions on the display.**

1) Turn ignition key off.
2) Disconnect negative (–) battery cable.
3) Hold down brake pedal for 10 seconds.
4) Connect negative (–) battery cable.

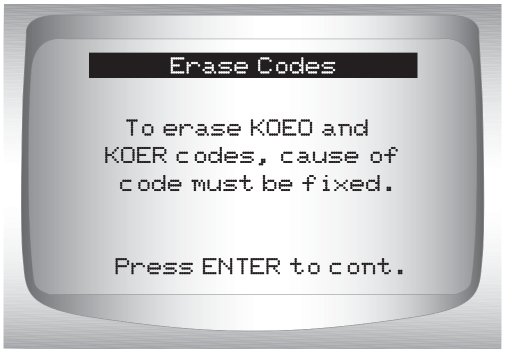


Erase Codes

Only memory codes are erasable!

Press ENTER to cont.

- Press **ENTER** after each message.



Erase Codes

To erase KOEO and KOER codes, cause of code must be fixed.

Press ENTER to cont.

CAUTION **Never lay tools on vehicle battery. Tools may create shorts and cause harm to user and damage to tools, battery and electrical system.**

✓ All continuous memory codes should be erased.

3. **Return to *Diagnostic Codes Menu.***

- Press **BACK**.

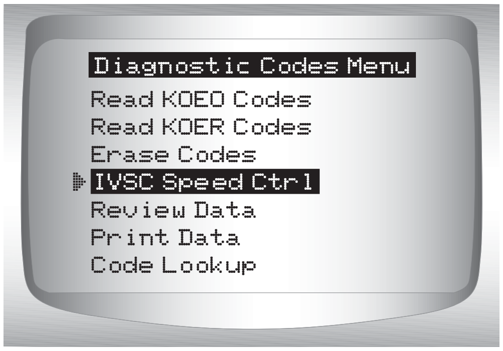
IVSC-Speed Ctrl (EEC-IV Vehicles)

✓ The **IVSC-Speed Ctrl** (Integrated Vehicle Speed Control) is Ford's computerized cruise control system on EEC-IV vehicles. It is controlled by the PCM and contains a dedicated network of sensors, switches, and actuators. Both KOEO and KOER Codes exist for this test. The Scan Tool provides the ability to diagnose problems by reading DTCs.

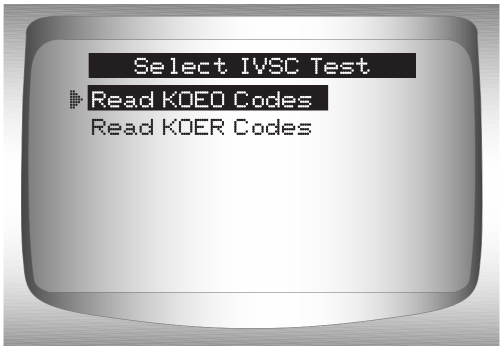
Reading IVSC KOEO Codes

From the ***Diagnostic Codes Menu:***

1. ***Select IVSC Speed Ctrl.***
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***IVSC Speed Ctrl*** is highlighted.
   - Press **ENTER**.


Diagnostic Codes Menu
Read KOEO Codes
Read KOER Codes
Erase Codes
IVSC Speed Ctrl
Review Data
Print Data
Code Lookup

2. **Select *Read KOEO Codes.***
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***Read KOEO Codes*** is highlighted.
   - Press **ENTER**.


Select IVSC Test
Read KOEO Codes
Read KOER Codes

3. **Perform the following:**

1)Set parking brake.
2) Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Start engine and let idle until hot.
5) Turn ignition key off.
6) Wait 10 seconds. Turn key on engine off. **Do not start engine**.

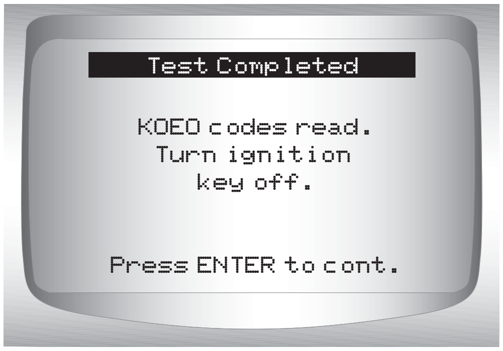
⚠CAUTION **Avoid cooling fan! It may turn on during test.**

✓ During testing, it is VERY IMPORTANT that each required step be performed when prompted by the Scan Tool. Failure to perform these steps may set DTC(s) in the PCM.

During this test, the Scan Tool prompts the user to perform the following steps:

- ❒ Press speed control ON button.
- ❒ Press speed control OFF, RESUME, COAST, and ACCEL buttons.
- ❒ Tap brake and clutch pedals.

4. **When test is completed.**
   - •Turn the ignition key off.
   - •Press **ENTER** to view the KOEO failures.

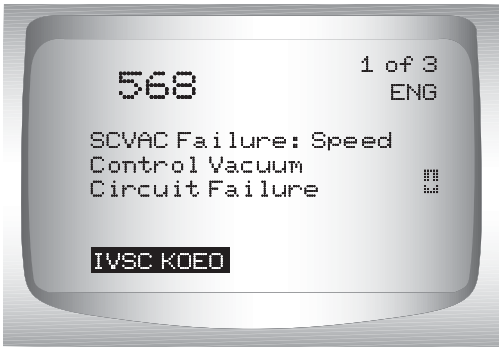


Test Completed

KOEO codes read.
Turn ignition
key off.

Press ENTER to cont.

5. **View and write down DTCs.**
   - •Use the ▲ **UP** or ▼ **DOWN** arrow keys.



568 1 of 3
ENG

SCVAC Failure: Speed
Control Vacuum
Circuit Failure

IVSC KOEO

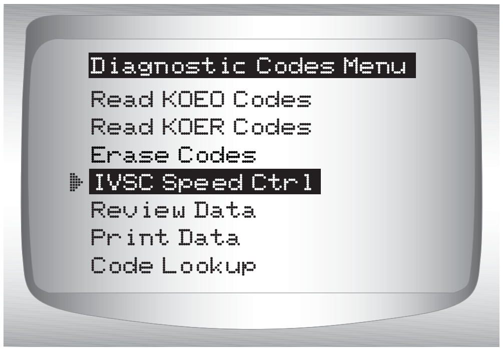
✓ ENG indicates that DTC is from the engine or powertrain computer.

6. **Return to *Diagnostic Codes Menu.***
   - •Press **BACK**.

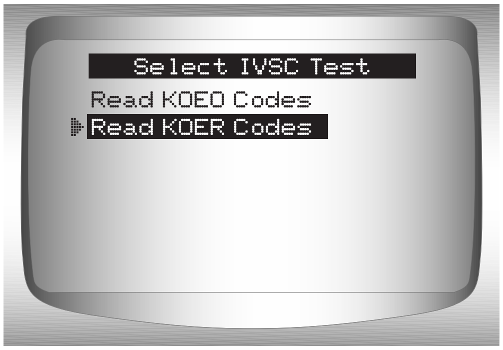
Reading IVSC KOER Codes

From the ***Diagnostic Codes Menu:***

1. **Select *IVSC Speed Ctrl*.**
   - •Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***IVSC Speed Ctrl*** is highlighted.
   - •Press **ENTER**.


Diagnostic Codes Menu
Read KOEO Codes
Read KOER Codes
Erase Codes
IVSC Speed Ctrl
Review Data
Print Data
Code Lookup

2. **Select *Read KOER Codes*.**
   - •Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***Read KOER Codes*** is highlighted.
   - •Press **ENTER**.


Select IVSC Test
Read KOEO Codes
Read KOER Codes

3. **Perform the following:**

1) Set parking brake.
2) Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Start engine and let idle until hot.
5) Turn ignition key off.
6) Wait 10 seconds. Start engine and let idle.

✓ During testing, the Scan Tool prompts the user to press the vehicle's speed control ON button.

⚠WARNING **Exhaust gases are harmful or lethal. Always operate vehicle in a well-ventilated area.**

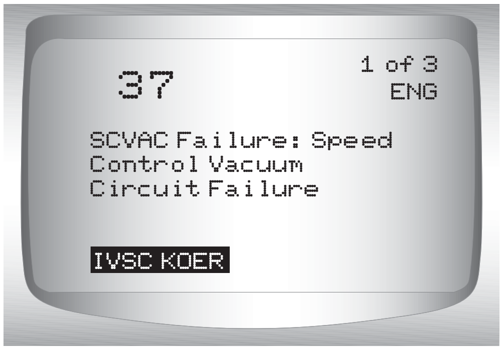
⚠CAUTION **The Read KOER test is done with the engine running. Do not over-rev engine. Observe all safety precautions.**

- ✓ During testing, it is VERY IMPORTANT that each required step be performed when prompted by the Scan Tool. Failure to perform these steps may set DTCs in the PCM. Be sure to observe the Scan Tool display for indications to perform these steps.
- ✓ Do not touch the throttle pedal during testing. The user is reminded of this by the Scan Tool.

- ✓ Once the codes have been read by the Scan Tool, it instructs the user to turn the ignition key off:

4. View and write down DTCs.

•Use the ▲ **UP** or ▼ **DOWN** arrow keys.



```
37                          1 of 3
                               ENG
SCVAC Failure: Speed
Control Vacuum
Circuit Failure

IVSC KOER
```

- ✓ ENG indicates that DTC is from the engine or powertrain computer.

5. Return to *Diagnostic Codes Menu.*

•Press ⏪ **BACK**.

On Demand Test Menu

IMPORTANT All items marked with “-” are covered either in section 3 or 4. These items are not covered in this section.

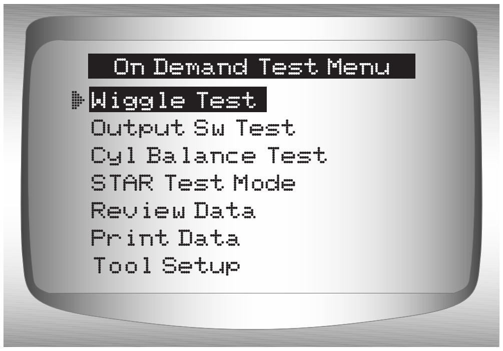
- ☐ **On Demand Test Menu**
  - ☐ Wiggle Test
  - ☐ Output Switch Test
  - ☐ Cyl Balance Test
  - ☐ STAR Test Mode
  - – Review Data
  - – Print Data
  - – Tool Setup

Wiggle Test (EEC-IV Vehicles)

✓ The **Wiggle Test,** often referred to as the Continuous Monitor Test, is used to locate intermittent electrical faults on EEC-IV vehicles. When the test is activated, the Scan Tool beeps and displays a message when a fault is present. If the problem is fixed or goes away, the tone and message goes away. Refer to the applicable service manual for circuits that can be tested.

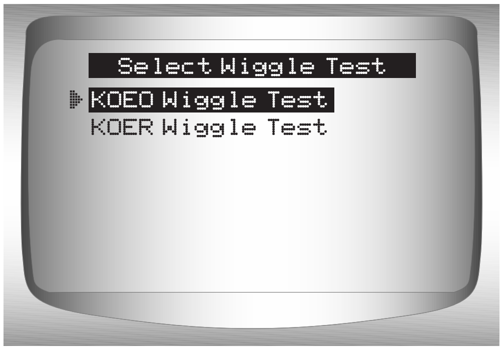
✓ If the Alert was turned off in the Tool Setup menu, it will be automatically activated for the **Wiggle Test**. Once the **Wiggle Test** is complete, the alert returns to its previous setting.

From the ***On Demand Test Menu:***


On Demand Test Menu
Wiggle Test
Output Sw Test
Cyl Balance Test
STAR Test Mode
Review Data
Print Data
Tool Setup

1. **Select *Wiggle Test*.**
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***Wiggle Test*** is highlighted.
   - Press **ENTER**.

✓ Either a KOEO or KOER Wiggle Test can be run. If the vehicle problem occurs while driving, the KOER Wiggle Test is recommended.


Select Wiggle Test
KOEO Wiggle Test
KOER Wiggle Test

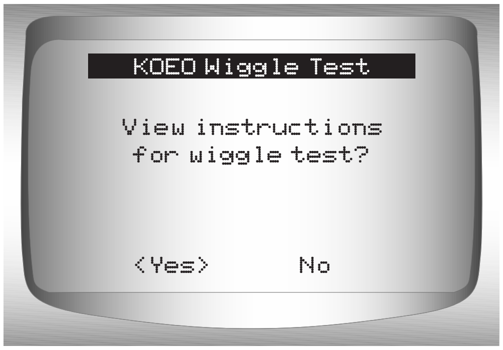
2. **After making a selection.**
   - Press **ENTER**.

3. **Perform the following:**

1) Set parking brake.
2) Put Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Turn ignition key off. Wait 10 seconds.
5) KOEO: Turn key on engine off. **Do not start engine.**
6) KOER: Turn key on engine running and let Idle.

4. **Wiggle Test instructions.**
   - Use the ◀ **LEFT** or ▶ **RIGHT** arrow key to view wiggle test instructions or not.
   - Press ENTER **ENTER** to continue.

✓ Instructions are available for viewing. The default is Yes. If No is selected, the test begins to initialize.



KOEO Wiggle Test

View instructions
for wiggle test?

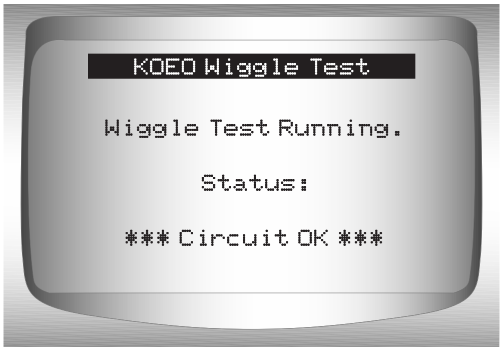
<Yes>   No

✓ If Yes is selected, the following instructions appear.

- ☐ Gently tap and shake the sensor.
- ☐ Wiggle the sensor connectors.
- ☐ Twist and shake the wiring between the sensor and the PCM.

5. **Start KOEO/KOER Wiggle Test.**
   - Press ENTER **ENTER**.

✓ After the 10-second initialization period, the Scan Tool is ready for the **Wiggle Test**. Locate the suspect sensor or circuit according to the above instructions.



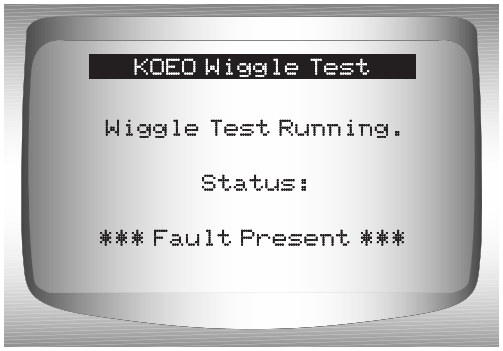
KOEO Wiggle Test

Wiggle Test Running.

Status:

*** Circuit OK ***

✓ If a fault is detected, the Scan Tool beeps and displays a FAULT PRESENT message. A DTC(s) is stored in the PCM and the Scan Tool.



KOEO Wiggle Test

Wiggle Test Running.

Status:

*** Fault Present ***

6. **Return to *On Demand Test Menu.***
   - Press ⏮ **BACK**.

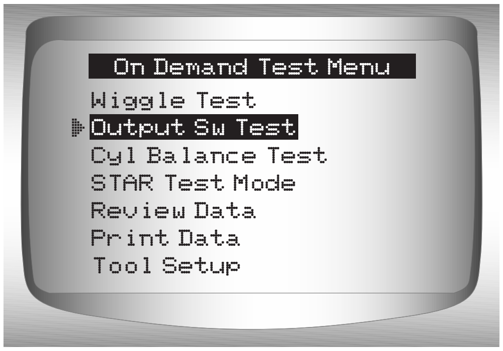
- ✓ Perform the "**Read KOEO Codes**" on page 6-7 to retrieve the DTC(s) set during wiggle test.
- ✓ After making all repairs, perform "**Erase Codes**" on page 6-13 to clear the memory.

Output Switch Test (EEC-IV Vehicles)

- ✓ The **Output Sw (Switch) Test**, also known as the Output State Check, is used to check the operation of the computer-controlled relays and solenoids on EEC-IV vehicles. The user can troubleshoot circuits using a voltmeter to measure voltage at the relays and solenoids in both energized and non-energized conditions. Record all measurments for reference.
- ✓ Fuel injectors are NOT energized during this test.
- ✓ On vehicles equipped with Integrated vehicle speed control (IVSC), failure to disconnect the vacuum supply hose from the speed control servo energizes the speed control solenoids.

From the ***On Demand Test Menu:***

1. **Select *Output Sw Test*.**
   - •Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***Output Sw Test*** is highlighted.
   - •Press **ENTER**.



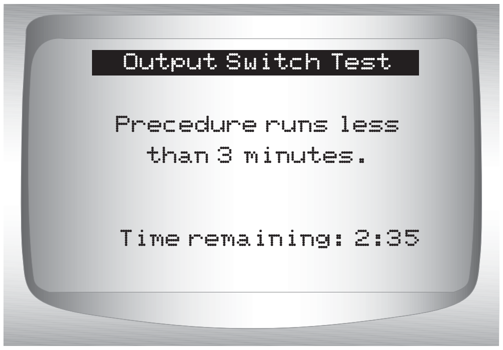
On Demand Test Menu
Wiggle Test
Output Sw Test
Cyl Balance Test
STAR Test Mode
Review Data
Print Data
Tool Setup

2. Perform the following:

1) Set parking brake.
2) Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Start engine and let idle until hot.
5) Turn ignition key off.
6) Wait 10 seconds.
7) Turn key on engine off. **Do not start engine**.

⚠CAUTION **Avoid cooling fan! It may turn on during test.**

✓ The test screen indicates the time remaining. Do not touch vehicle or tools during this time until the next screen appears.



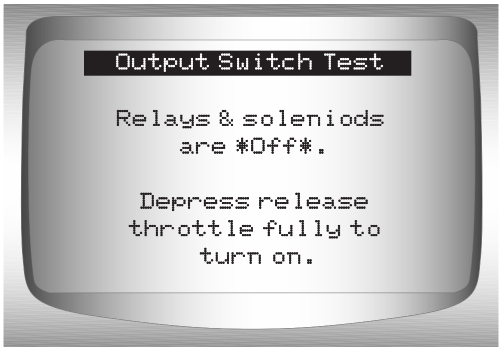
Output Switch Test

Precedure runs less than 3 minutes.

Time remaining: 2:35

3. Toggle relays and solenoids.

✓ Press the accelerator pedal fully to turn ON relays and solenoids. Do the same to turn them off. This can be repeated as many times as required to locate the fault.



Output Switch Test

Relays & soleniods are *Off*.

Depress release throttle fully to turn on.

4. Return to *On Demand Test Menu.*

- •Turn the ignition key off.
- •Press ⏮ **BACK**.

Cylinder (Cyl) Balance Test (EEC-IV Vehicles)

✓ The **Cyl Balance Test** is only applicable to engines equipped with EEC-IV Sequential Electronic Fuel Injection (SEFI or SFI).

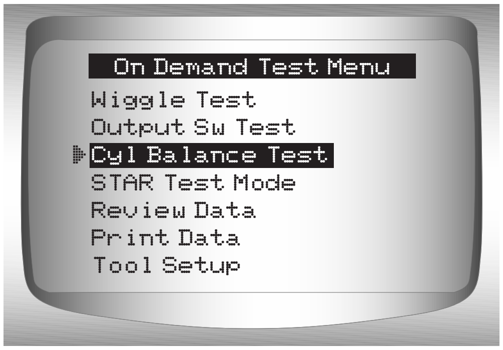
✓ The **Cyl Balance Test** identifies a weak cylinder(s) on EEC-IV vehicles. A weak cylinder may be caused by low compression, poor valve seating, fouled spark plugs, damaged fuel injectors, and other cylinder faults. The PCM shuts off the fuel supply to each cylinder and measures the RPM drop. The PCM then calculates variations between cylinders thus identifying the weak ones.

⚠WARNING **Exhaust gases are harmful or lethal. Always operate vehicle in a well-ventilated area.**

⚠CAUTION **The Cyl Balance Test is done with the engine running. Do not over-rev engine. Observe all safety precautions.**

From the ***On Demand Test Menu:***

1. **Select *Cyl Balance Test*.**
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***Cyl Balance Test*** is highlighted.
   - Press **ENTER**.



⚠CAUTION **Keep hands and tools away from fan and engine during test.**

2. **Perform the following:**

1) Set parking brake.
2) Transmission in park (P) or neutral (N).
3) Turn A/C off.
4) Start engine and let idle until hot.
5) Turn ignition key off.
6) Wait 10 seconds. Start engine and let idle.
7) If vehicle is equipped with a manual transmission, release clutch.

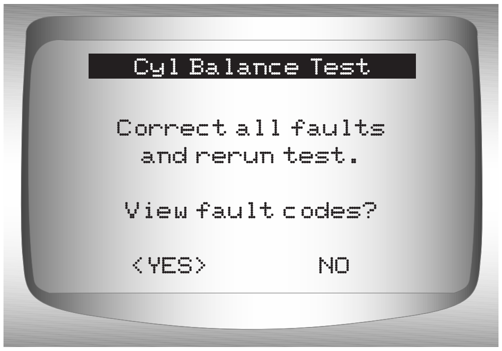
Press **ENTER** to continue.

3. **Wait for the Cylinder ID.**
   - Follow all user prompts:

     ☐ Work steering wheel
     ☐ Pump brake pedal and cycle overdrive (OD) cancel switch.

✓ Observe the screen for the prompt to perform the next action.
  ☐ Quickly press and release the throttle. One time only!

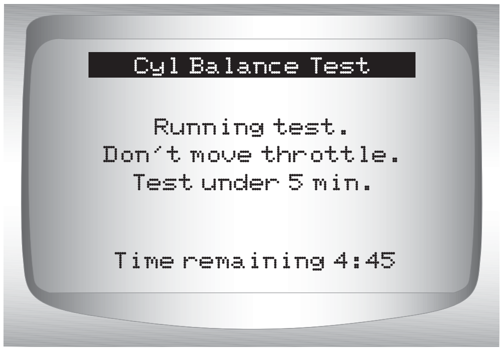
✓ If no DTC is present, continue with the paragraph following the note below. If any DTC(s) are present, the **Cyl Balance Test** stops and the Scan Tool displays the screen to the right.



```
Cyl Balance Test

Correct all faults
and rerun test.

View fault codes?

<YES>        NO
```

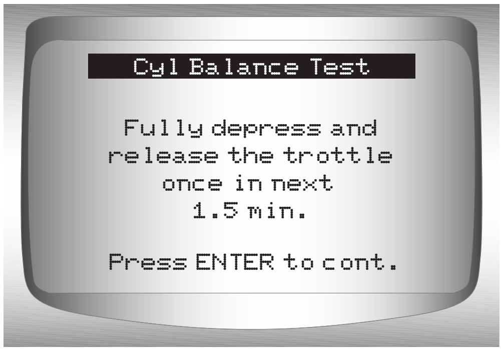
✓ Select YES to review the DTC(s), then turn engine off. Record them and make repairs before repeating the **Cyl Balance Test**.

✓ In the next step, **do not** touch any vehicle or Scan Tool keys while the test is running. Allow engine to idle. Engine speed may drop or become uneven — this is normal.



```
Cyl Balance Test

Running test.
Don't move throttle.
Test under 5 min.


Time remaining 4:45
```

4. **Start *Cyl Balance Test.***
   - Depress and release the throttle halfway within the next 1.5 minutes.
   - Press **ENTER** to continue.
   - **Do not** move the throttle.



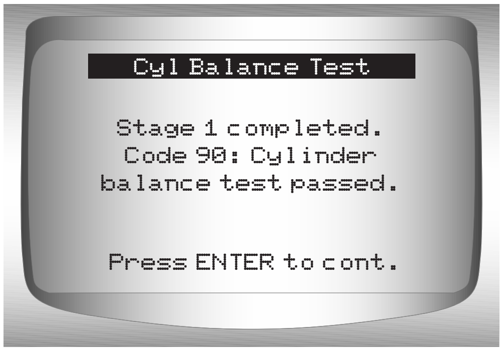
```
Cyl Balance Test

Fully depress and
release the trottle
once in next
1.5 min.

Press ENTER to cont.
```

✓ If throttle is moved after pressing and releasing the Scan Tool displays an error message indicating the test failed due to throttle movement.

✓ Noise from the throttle position sensor (TPS) may cause the test to abort even though the throttle was not moved.

5. View test results.

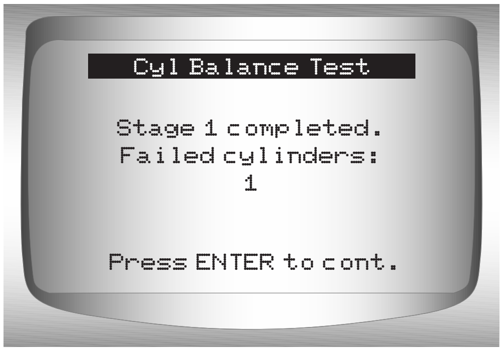
✓ If the engine operates properly, the screen to the right displays. Press **ENTER** to continue.



```
Cyl Balance Test

Stage 1 completed.
Code 90: Cylinder
balance test passed.

Press ENTER to cont.
```

✓ If a problem exists with one or more cylinders, the Scan Tool displays a list of failed cylinder(s). Press **ENTER** to continue.

✓ Refer to the applicable service manual for cylinder numbering sequence. Cylinder failure may be caused by faulty injectors, sparks plugs, or wiring.



```
Cyl Balance Test

Stage 1 completed.
Failed cylinders:
1

Press ENTER to cont.
```

✓ Press **ENTER** to continue — the Scan Tool prompts the user to retest (up to three times). If required, rerun the test to double check the results, or to check for weaker or dead cylinders.

6. Return to *On Demand Test Menu.*

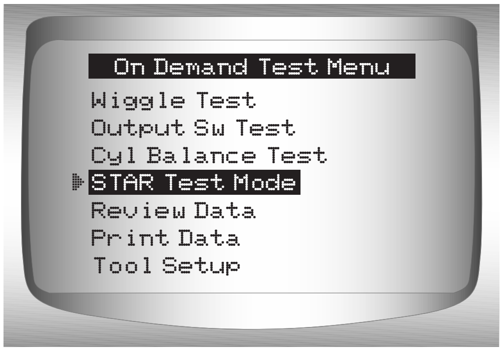
•Press **BACK**.

STAR Test Mode (EEC-IV, MECS and MCU Vehicles)

✓ The **STAR Test Mode** can be used to retrieve DTCs from the PCM or other self-test automatic readout (STAR) compatible controllers installed in the vehicle. **STAR Test Mode** functions largely the same way and serves the same purpose as running KOEO and KOER tests. It is generally used as a last resort to check for DTCs in systems which may not be covered by KOEO and KOER testing (i.e. - Computer Ride Control suspension systems).

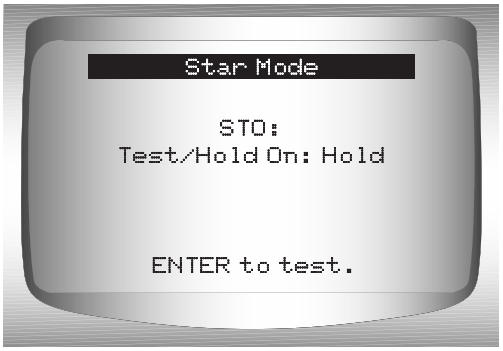
From the ***On Demand Test Menu:***

1. **Select *STAR Test Mode*.**
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***STAR Test Mode*** is highlighted.
   - Press **ENTER**.



On Demand Test Menu
Wiggle Test
Output Sw Test
Cyl Balance Test
STAR Test Mode
Review Data
Print Data
Tool Setup

2. **Follow the instructions on the Scan Tool screen to access DTCs from the PCM.**
   - Pressing **ENTER** begins test.

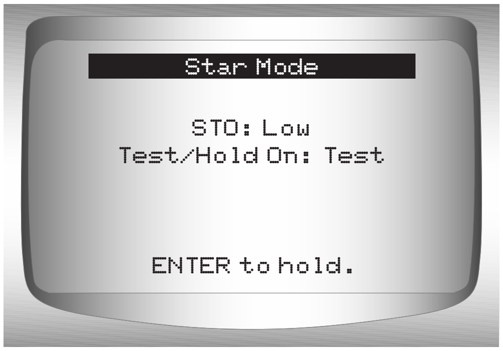


Star Mode

STO:
Test/Hold On: Hold

ENTER to test.

✓ The TEST/HOLD parameter indicates the state of the self-test input (STI). The **ENTER** key toggles this state from TEST to HOLD.



Star Mode

STO: Low
Test/Hold On: Test

ENTER to hold.

✓ With the STI in the TEST state, the self-test begins. The Self-Test Output (STO) parameter flashes either a HIGH or LOW. A beep accompanies each LOW flash. Write down the 2– digit or 3 – digit code for reference.

✓ Disregard the blink which may occur when ignition key is turned on. Depending on the vehicle being tested, determines if a three digit or 2 digit code is used. If required, refer to the service manual for applicable code structure.

- ☐ A digit consists of consecutive LOW flashes or beep — count the number of LOWs for the digit
- ☐ A short HIGH (short pause) occurs between digits.
- ☐ A long HIGH (long pause) occurs between codes.
- ☐ There is no flash for the digit 0 (zero).

✓ After all codes are sent, the series repeats once and then stops. An example is shown below.

A Three-Digit DTC (214) will Flash as follows:	
STO: LOW-LOW	=**2**XX (Hundreds Place =2)
STO: HIGH	Short Pause
STO: LOW	=2**1**X (Tens Place =1)
STO: HIGH	Short Pause
STO: LOW-LOW-LOW-LOW	=21**4** (Ones Place =4)
Two-Digit DTCs (12, 42) will Flash as follows:	
STO: LOW	=**1**X (Tens Place =1)
STO: HIGH	Short Pause
STO: LOW-LOW	=1**2** (One's Place =2)
STO: HIGH	Long Pause (Between DTCs)
STO: LOW-LOW-LOW-LOW	=**4**X (Tens Place =4)
STO: HIGH	Short Pause
STO: LOW-LOW	=4**2** (Ones Place =2)

✓ If necessary, refer to an appropriate service manual for the procedure on how to use **STAR Test Mode** for the specific vehicle under test.

3. Return to the *On Demand Test Menu*.

•Press ⏪ **BACK**.

Ford Enhanced (OBD II) Diagnostics

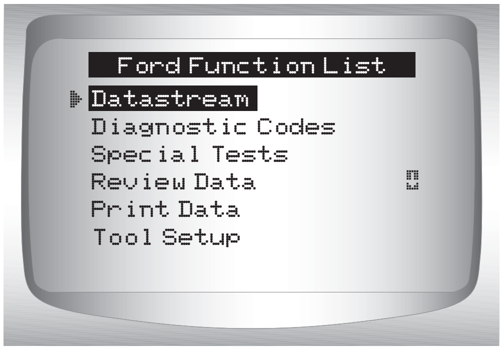
IMPORTANT This system applies to Ford vehicles manufactured from 1996 to present. Some vehicles in 1994 and 1995 were equipped with the EEC-V system. Refer to **"Appendix B - Data Link Connectors"**

Ford Function List

IMPORTANT All items marked with "-" are covered in section 3 or 4. These items are not covered in this section.

✓ The ***Ford Function List*** is broken down into the following menus:

- ❒ **Datastream Menu**
  - – Review Data
  - – Print Data
  - – Tool Setup
- ❒ **Diagnostic Codes Menu**
  - ❒ Read Codes
  - – Pending Codes
  - – Erase Codes
  - – View Freeze Data
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup


Ford Function List
Datastream
Diagnostic Codes
Special Tests
Review Data
Print Data
Tool Setup

(List Continued)

- **Special Tests Menu**
  - I/M Readiness
  - Drive Cycle Monitor
  - State OBD Check
  - O2 Monitor Test
  - Diagnostic Monitor Test
  - On-Board Systems
  - Vehicle Information
  - Modules Present
  - Review Data
  - Print Data
  - Tool Setup

❒ **Review Data**

❒ **Print Data**

- •I/M Readiness
- •State OBD Check
- •Read Codes
- •Pending Codes
- •Freeze Frame
- •O2 Monitor Test
- •Diagnistic Monitor Test
- •Playback
- •Vehicle Information

✓ For Ford Enhanced diagnostics, the above functions have data to review or print. For ***Review/Print Data*** instructions, refer to the appropriate page in **Using The Scan Tool**.

- **Tool Setup Menu**
  - English/Metric
  - Contrast Adjust
  - Beeper
  - Setup User Key

IMPORTANT If the function is not supported by the vehicle, the Scan Tool does not display it.

✓ If an **Error Message** displays, make sure the OBD II connector is securely attached, and the ignition key is on. Cycle the ignition key to off for 10 seconds, then on. This may be required to reset the computer. If required, select yes to try again. If the problem still exists, refer to **Error Messages** on page 9-2.

Diagnostic Codes Menu

IMPORTANT All items marked with "-" are covered either in section 3 or 4. These items are not covered in this section.

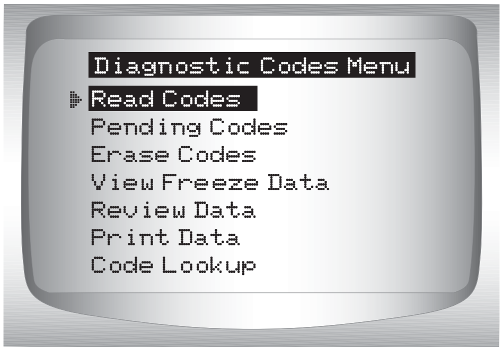
❐ **Diagnostic Codes Menu**
- Read Codes
- Pending Codes
- Erase Codes
- View Freeze Data
- Review Data
- Print Data
- Code Lookup
- Tool Setup

Read Codes

✓ The **Read Codes** function retrieves DTCs from the vehicle's computer module(s). This function can be performed KOEO or KOER. The **Read Codes** function retrieves all DTCs (MIL, non-MIL and Pending) stored in the vehicle's computer module(s).

From the ***Diagnostic Codes Menu:***

1. **Select *Read Codes.***
   - •Use the ▲ **UP** or ▼ **DOWN** arrow keys until ***Read Codes*** is highlighted.
   - •Press **ENTER**.

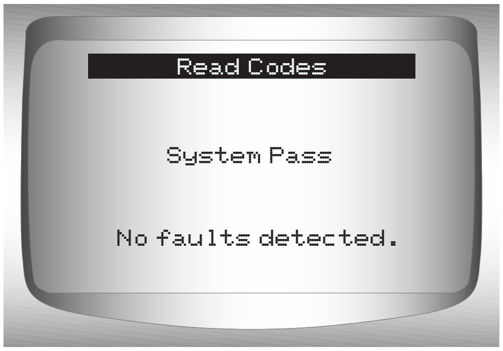


Diagnostic Codes Menu

Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

✓ The Scan Tool retrieves the DTCs stored in the vehicle's computer module(s).

✓ If no DTCs are present a message stating System Pass: No faults detected is displayed.



Read Codes

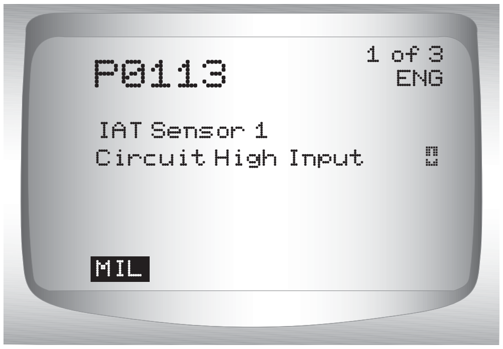
System Pass

No faults detected.

2. **View and write down DTCs.**
   - Use the ▲ **UP** or ▼ **DOWN** arrow keys.

☐ In the examples shown:

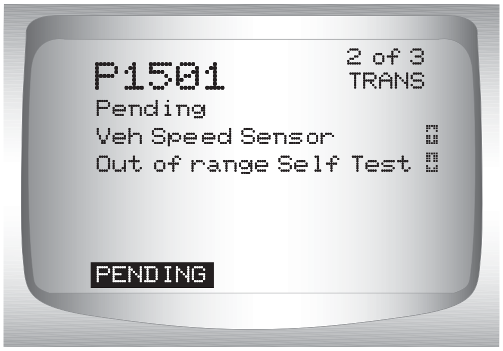
  - ☐ MIL indicates that this DTC has turned on the MIL light.
  - ☐ Pending Indicates a Global OBD II pending code. Refer to Pending Codes in Global OBD II Diagnostics.
  - ☐ Non-MIL is a DTC that is not emission-related and did not turn on the MIL light.
  - ☐ ENG indicates the DTC is stored in the engine or powertrain computer.
  - ☐ TRANS indicates that the DTC is stored in the Transmission computer.



P0113 1 of 3
ENG

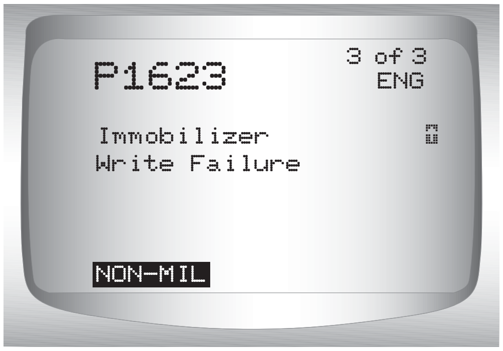
IAT Sensor 1
Circuit High Input

MIL



P1501 2 of 3
TRANS
Pending
Veh Speed Sensor
Out of range Self Test

PENDING



P1623 3 of 3
ENG

Immobilizer
Write Failure

NON-MIL

IMPORTANT Until all monitors have ran, the absence of a DTC does not mean the fault has been fixed.

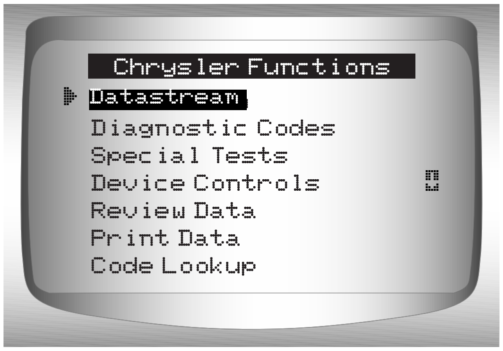
Section 7 – Chrysler Diagnostics

✓ Due to different processor calibrations used, all Chrysler functions for a particular vehicle may or may not appear as shown. Based on the vehicle information entered at the Vehicle Setup menu, the Scan Tool recognizes the computer system installed.

Chrysler Function List

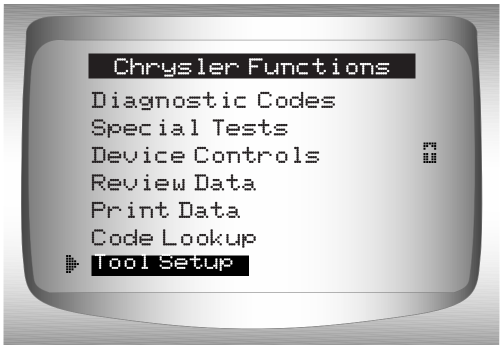
IMPORTANT All items marked with “-” are covered in section 3 or 4. These items are not covered in this section.

✓ The ***Chrysler Function List*** is broken down into the following menus:


Chrysler Functions
Datastream
Diagnostic Codes
Special Tests
Device Controls
Review Data
Print Data
Code Lookup

- ☐ **Datastream Menu**
  - ☐ View Data
  - ☐ Record Data
  - ☐ Sensor Test
  - – Review Data
  - – Print Data
  - – Tool Setup
- ☐ **Diagnostic Codes Menu**
  - ☐ Read Codes
  - – Pending Codes
  - ☐ Erase Codes
  - – View Freeze Data
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup

(List Continued)


Chrysler Functions
Diagnostic Codes
Special Tests
Device Controls
Review Data
Print Data
Code Lookup
Tool Setup

- ❒ **Special Tests Menu**
  - I/M Readiness
  - Drive Cycle Monitor
  - State OBD Check
  - O2 Monitor Test
  - Diagnostic Monitor Test
  - On-Board Systems
  - Vehicle Information
  - Modules Present
  - Review Data
  - Print Data
  - Tool Setup

- ❒ **Device Controls Menu**
  - ❒ Switch Test
  - ❒ Actuator Test
  - ❒ Idle Speed Test
  - Review Data
  - Print Data
  - Tool Setup

- ❒ **Review Data**

- ❒ **Print Data**
  - •I/M Readiness
  - •O2 Monitor Test
  - •Diagnostic Monitor Test
  - •Vehicle Information
  - •Modules Present
  - •Read Codes
  - •Pending Codes
  - •View Freeze Data
  - •Playback
  - •State OBD Check

(List Continued)

✓ The above stored infromation can be reviewed for Chrysler vehicles. Refer to ***Review Data*** and ***Print Data*** in the **Using the Scan Tool** section of this manual.

- **Code Lookup**
- **Tool Setup Menu**
  - English/Metric
  - Contrast Adjust
  - Beeper
  - Setup User Key

IMPORTANT If the function is not supported by the vehicle, then the Scan Tool does not display it.

✓ If an **Error Message** displays, make sure the adapter cable is securely attached, and the ignition key is on. Cycle the ignition key to off for 10 seconds, then on. This may be required to reset the computer. If required, select yes to try again. If the problem still exists, refer to **“Error Messages**” on page 9-2 of **Troubleshooting.**

✓ Screens and functions may differ slightly for vehicle make and year.

Datastream Menu

IMPORTANT All items marked with “-” are covered in section 3 or 4. These items are not covered in this section.

❒ **Datastream Menu**
  ❒ View Data
  ❒ Record Data
  ❒ Sensor Test
  – Review Data
  – Print Data
  – Tool Setup

View Data

✓ The **View Data** function allows the user to view the vehicle parameter identification (PID) data in real time. As the powertrain control module (PCM) monitors PIDs, they are simultaneously transmitted to the Scan Tool. The PIDs are continuously updated at the PCM’s rate.

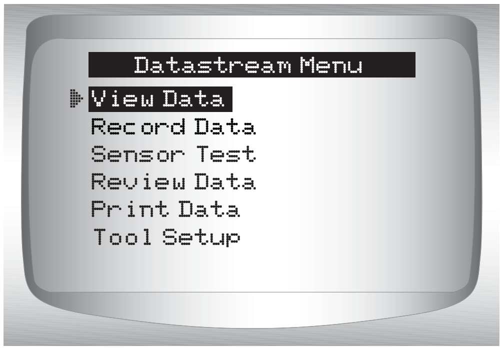
✓ In addition to reading codes, **View Data** is the most useful diagnostic function for isolating the cause of a vehicle operation problem. Viewing data is also used for observing sensor data and the on/off state of switches, solenoids, and relays.

✓ **View Data** can be performed with the ignition key on-engine off (KOEO) or key on engine running (KOER).

⚠WARNING **Never operate the Scan Tool while driving. Have another person assist with the operation of the Scan Tool.**

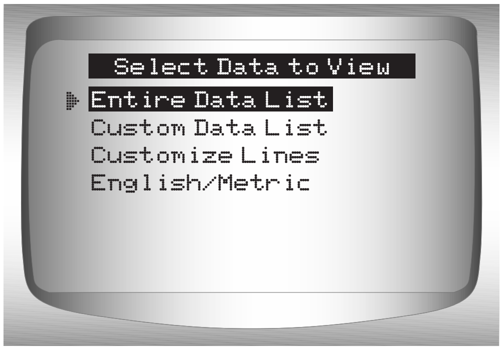
From the ***Datastream Menu***:

1. **Select *View Data*.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***View Data*** is highlighted.
   - •Press ENTER **ENTER**.



⚠CAUTION **Keep hands and tools away from fan and engine during test.**

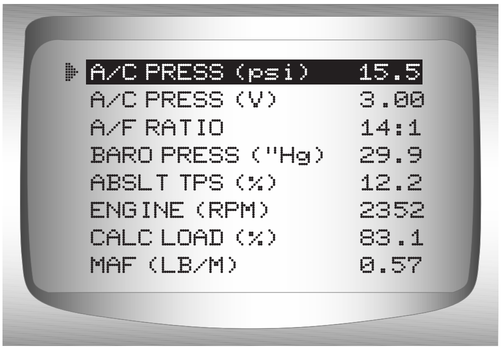
2. **Select the type of data to view.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key to highlight.



```
 Select Data to View
▶Entire Data List
 Custom Data List
 Customize Lines
 English/Metric
```

✓ For additional ***View Data*** information, refer to “**Section 4 - Global OBD II Diagnostics**"of this manual.

3. **View PIDs on Scan Tool.**
   - Use ▲ **UP** or ▼ **DOWN** arrow keys.



```
▶A/C PRESS (psi)    15.5
 A/C PRESS (V)      3.00
 A/F RATIO          14:1
 BARO PRESS ("Hg)   29.9
 ABSLT TPS (%)      12.2
 ENGINE (RPM)       2352
 CALC LOAD (%)      83.1
 MAF (LB/M)         0.57
```

✓ A n/a or - - - indicates the PID is not used by the vehicle.

4. **Change the selection of Custom Data List parameters.**
   - Press ⏮ **BACK**.

5. **Return to the *Datastream Menu*.**
   - Press ⏮ **BACK**.

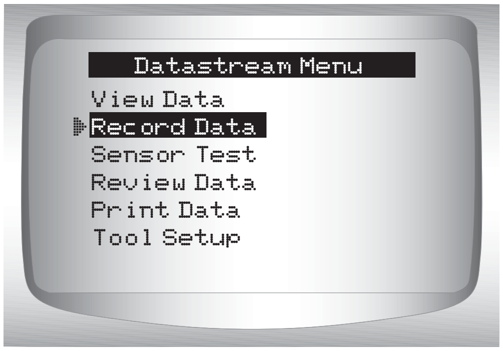
Record Data

- ✓ The **Record Data** function records vehicle PID data while the vehicle is parked or being driven. This function is mainly used for diagnosing intermittent driveability problems that cannot be isolated by any other method.
- ✓ The Scan Tool records data based on time (5 frames prior to the start of the recording, and for a duration after). The time after depends on the vehicle data rate.
- ✓ The **Record Data** function allows diagnosis of an intermittent problem by analyzing data leading up to the problem, during the problem, and possibly after the problem, depending on duration.

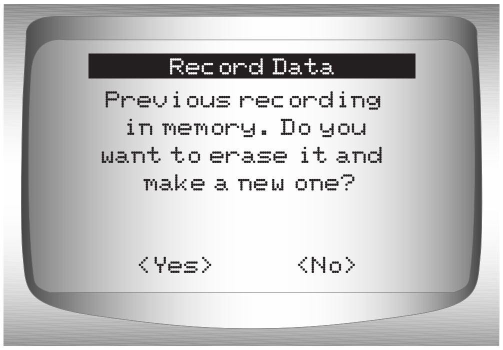
From the ***Datastream Menu***:

1. Select *Record Data*.

- •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Record Data*** is highlighted.
- •Press **ENTER**.



- ✓ The Scan Tool can maintain only one recording at a time. Be sure to thoroughly review the old recording before erasing it.
- ✓ If a recording currently exists in memory, a message to Erase Old Recording is displayed. The Scan Tool stores only one recording at a time, so be sure to review it before erasing it.



Previous recording in memory. Do you want to erase it and make a new one?

- •Next, turn the ignition key on. Engine can be off or running.

2. Refer to *"*Record Data" on page 4-9 of Global OBD II Diagnostics.

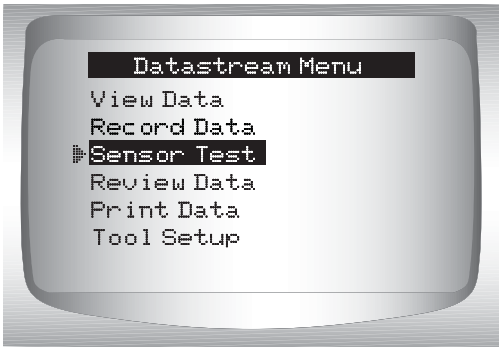
Sensor Test

✓ The **Sensor Test** is used to view the sensor outputs of some monitored vehicle systems. The **Sensor Test** is similar to **View Data**, as it allows the user to read the current output of various sensors throughout the vehicle.

NOTE: Sensor Test is only available on 1989-1995 Chrysler vehicles.

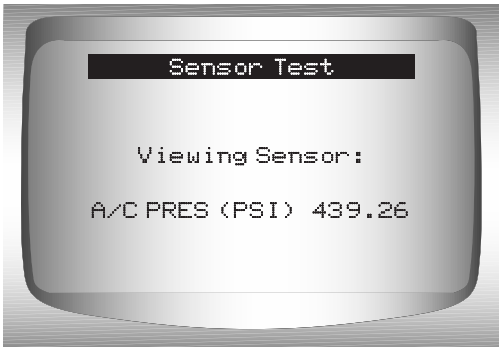
From the ***Datastream Menu***:

1. **Select *Sensor Test*.**
   - •Use **UP** or **DOWN** arrow key until ***Sensor Test*** is highlighted.
   - •Press **ENTER**.


Datastream Menu
View Data
Record Data
Sensor Test
Review Data
Print Data
Tool Setup

2. **Turn ignition key on — Engine can be off or running.**
   - •Press **ENTER** and the Scan Tool will build a list of sensors and display them.

3. **View sensors on Scan Tool.**
   - •One sensor will be displayed per screen. Use the **UP** or **DOWN** arrow keys to scroll through the supported sensors. The Scan Tool displays the status of the sensor.


Sensor Test

Viewing Sensor:

A/C PRES (PSI) 439.26

4. **Return to the *Datastream Menu*.**
   - •Press **BACK**.

Diagnostic Codes Menu

IMPORTANT All items marked with "-" are covered in section 3 or 4. These items are not covered in this section.

- ❒ **Diagnostic Codes Menu**
  - ❒ Read Codes
  - – Pending Codes
  - ❒ Erase Codes
  - – View Freeze Data
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup

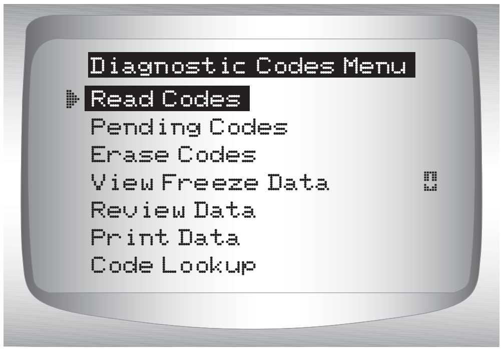
Read Codes

✓ The **Read Codes** function enables the Scan Tool to retrieve and display any specific emission-related diagnostic trouble codes (DTC) stored in vehicle's memory. This function can be performed with key on engine off (KOEO) or key on engine running (KOER).

From the ***Diagnostic Codes Menu***:

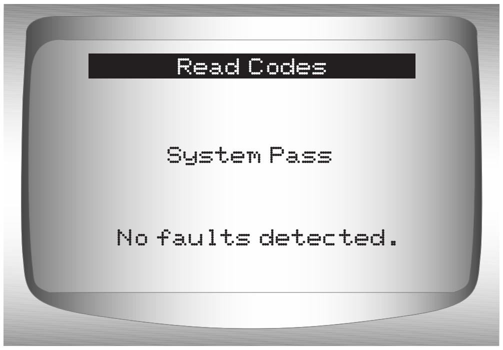
1.Select *Read Codes*.

- •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Read Codes*** is highlighted.
- •Press ENTER **ENTER**.


Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

⚠CAUTION **Keep hands and tools away from fan and engine during test.**

✓ If no DTCs have been stored in vehicle's memory, a System Pass screen displays.



Read Codes

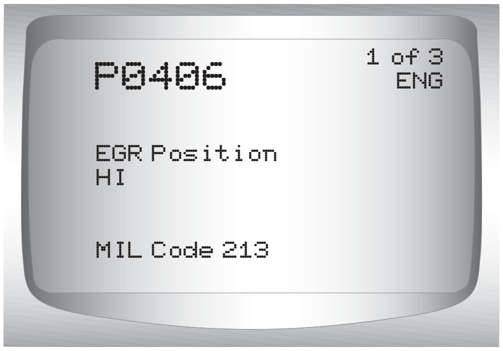
System Pass

No faults detected.

2. View and write down DTCs.

- Use the ▲ **UP** or ▼ **DOWN** arrow keys to scroll through the DTCs.

✓ The DTCs are categorized by ENG (engine) or TRANS (transmission). The Chrysler MIL code (3-digit) and SAE code (5-digit) follow.

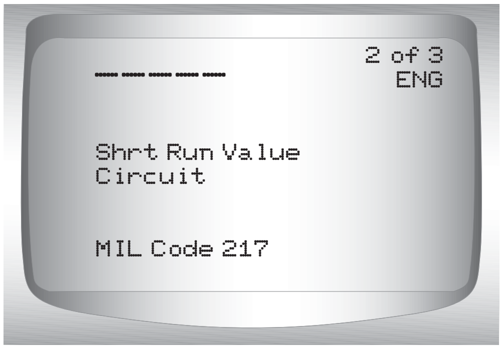


P0406 1 of 3 ENG

EGR Position HI

MIL Code 213

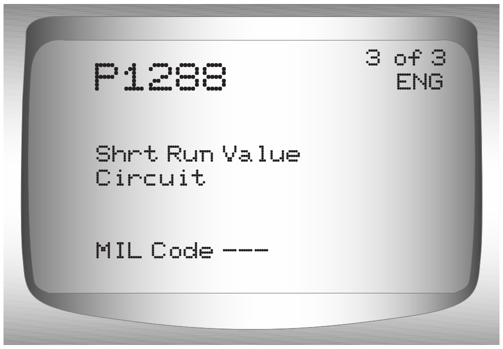
✓ There may be times where only one or both display. Dashes display if the DTC type does not exist.



------ 2 of 3 ENG

Shrt Run Value Circuit

MIL Code 217



P1288 3 of 3 ENG

Shrt Run Value Circuit

MIL Code ---

3. Return to *Diagnostic Codes Menu*.

- Press **BACK**.

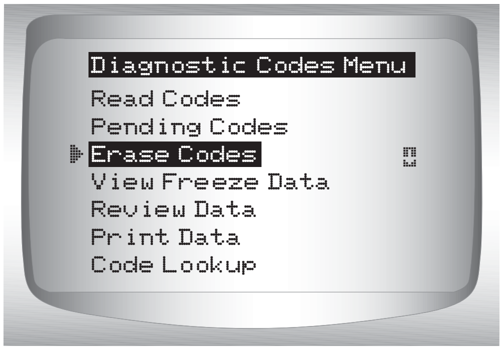
Erase Codes

- ✓ The **Erase Codes** function deletes the DTCs from the vehicle's computer memory. Perform this function only after the systems have been checked completely and DTCs have been documented. This function should be performed KOEO. Do not start engine.
- ✓ After servicing the vehicle, erase the stored DTCs, perform a road test, and then verify no new codes have been stored. If DTCs return, the problem has not been corrected or other faults are present.

From the ***Diagnostic Codes Menu***.

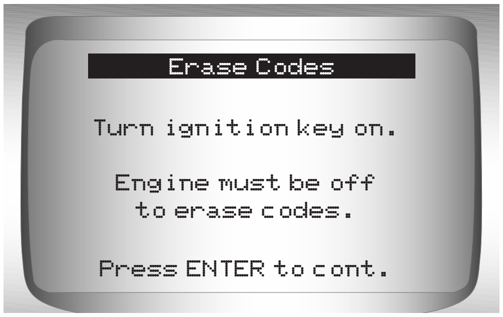
1. Select *Erase Codes*.

- •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Erase Codes*** is highlighted.
- •Press **ENTER**.


Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

2. Follow the instructions.

- •Press **ENTER**.

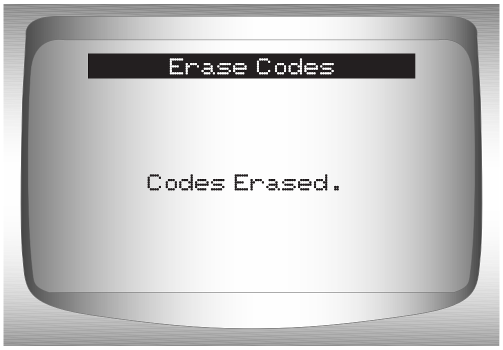

Erase Codes

Turn ignition key on.

Engine must be off to erase codes.

Press ENTER to cont.

- ✓ A message confirms the codes are erased.


Erase Codes

Codes Erased.

3. Return to *Diagnostic Codes Menu.*

- •Press **ENTER**.

Device Controls Menu

IMPORTANT All items marked with "-" are covered in section 3 or 4. These items are not covered in this section.

- ❐ **Device Controls Menu**
  - ❐ Switch Test
  - ❐ Actuator Test
  - ❐ Idle Speed Test
  - – Review Data
  - – Print Data
  - – Tool Setup

Switch Test

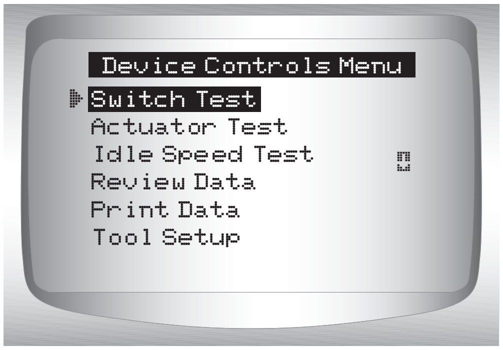
✓ The **Switch Test** is used to test the operation of switches on various Chrysler vehicle systems. These systems may include cruise control, A/C, braking, and the shift lever position.

✓ Because of differences in vehicle designs, the **Switch Test** may not test the same switches in every car.

NOTE: Switch Test is only available on 1989-1995 Chrysler vehicles.

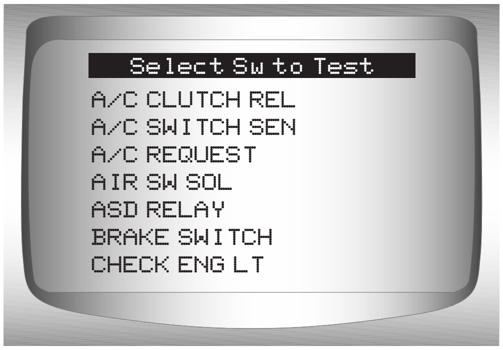
From the ***Device Controls Menu***:

1. **Select *Switch Test*.**
   - •Use UP or DOWN arrow key until ***Switch Test*** is highlighted.
   - •Press **ENTER**.



Device Controls Menu
Switch Test
Actuator Test
Idle Speed Test
Review Data
Print Data
Tool Setup

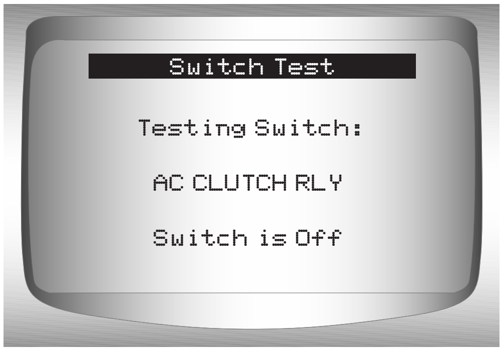
2. **Select switch to test.**
   - •Use the UP or DOWN arrow key.
   - •Press **ENTER**.



Select Sw to Test
A/C CLUTCH REL
A/C SWITCH SEN
A/C REQUEST
AIR SW SOL
ASD RELAY
BRAKE SWITCH
CHECK ENG LT

✓ Switches for the engine and transmission are combined into one list when applicable.

3. **Operate selected switch.**
   - To test switch, press the switch. The switch status on the bottom should change if the switch is working.



Switch Test

Testing Switch:

AC CLUTCH RLY

Switch is Off

4. **To test another switch.**
   - Press **BACK**.
5. **Return to the *Device Controls Menu*.**
   - Press **BACK**.

Actuator Test

✓ The **Actuator Test** is used to check the operation of many of the computer-controlled relays and solenoids. This is also helpful for checking voltages and output signals. Use a voltmeter to check the output signals at each relay and solenoid to verify their operation. To do this, take voltage readings at relays and solenoids before beginning this test. Then activate the test to energize the relays and solenoids. Check voltages again to determine if they are functioning properly. Remember to write down readings for reference.

✓ Not all vehicles have the same actuators. The Scan Tool will not allow the test of actuators not present on the vehicle.

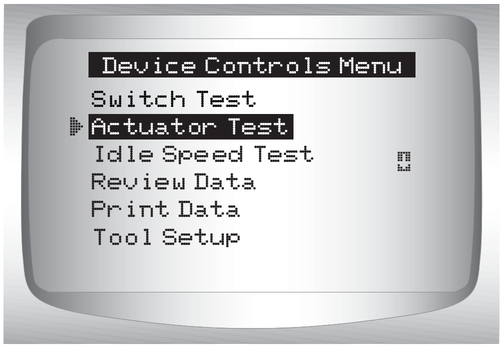
⚠CAUTION **Some Actuator Tests may activate the fuel pump. Do not disconnect any fuel lines or remove fuel injectors unless it is required by the service manual. Be sure to reconnect all lines when testing is complete.**

⚠WARNING **Gasoline leaking onto hot engine and exhaust parts can cause fire or other hazardous conditions.**

NOTE: Actuator Test is only available on 1989-1995 Chrysler vehicles.

.From the ***Device Controls Menu***:

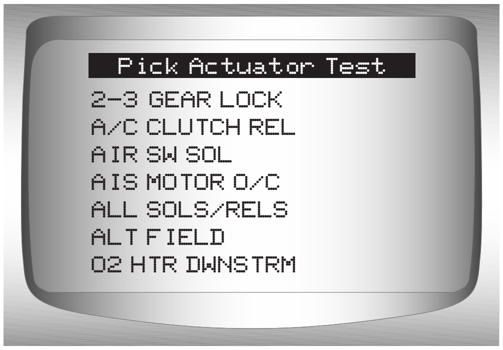
1. **Select *Actuator Test*.**
   - Use ▲ **UP** or ▼ **DOWN** arrow key until ***Actuator Test*** is highlighted.
   - Press **ENTER**.



✓ Follow all instructions on the Scan Tool screen. It will prompt the user when to turn the ignition key on, do not start the engine.

2. Select Actuator to test.

- Use the ▲ **UP** or ▼ **DOWN** arrow key.
- Press **ENTER**.

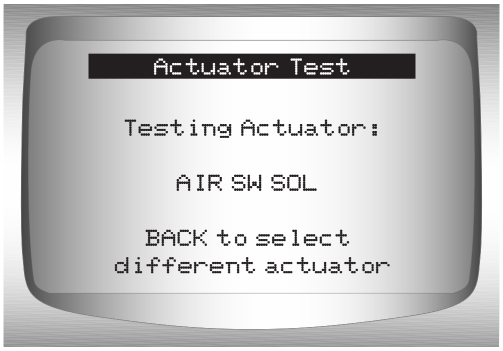


Pick Actuator Test
2-3 GEAR LOCK
A/C CLUTCH REL
AIR SW SOL
AIS MOTOR O/C
ALL SOLS/RELS
ALT FIELD
O2 HTR DWNSTRM

✓ Actuators for the engine and transmission are combined into one list when applicable.

✓ If the actuator selected is not available for the vehicle under test, the Scan Tool will indicate so. If the actuator is available, the Scan Tool will energize that actuator.

✓ Use a voltmeter to test the actuator for correct operation.



Actuator Test

Testing Actuator:

AIR SW SOL

BACK to select
different actuator

3. To test another actuator.

- Press **BACK**.

4. Return to the *Device Controls Menu*.

- Press **BACK**.

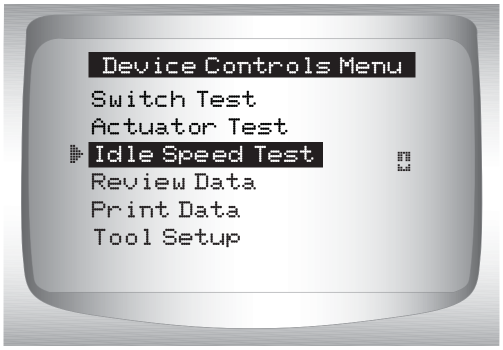
Idle Speed Test

✓ The **Idle Speed Test** is used to test the functionality of the vehicle idle speed control system. The test allows the user to enter the desired engine speed. The test vehicle should respond by matching the speed commanded. If the vehicle matches the comanded engine speed, the idle speed control system is functioning properly.

NOTE: Idle Speed Test is only available on 1989-1995 Chrysler vehicles.

From the ***Device Controls Menu***:

1. **Select *Idle Speed Test*.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Idle Speed Test*** is highlighted.
   - •Press ENTER **ENTER**.



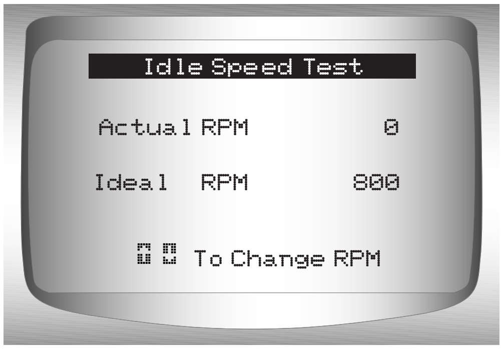
✓ The Scan Tool instructions may vary depending on the vehicle information entered. However, in all cases it will instruct the user to perform the following:

- ❒ Set the parking brake.
- ❒ Turn A/C off.
- ❒ Start engine and let idle.

⚠WARNING **Keep hands and tools away from fan and engine during test.**

⚠WARNING **Carbon monoxide (CO) and other vehicle emissions are harmful or fatal to personnel. Always operate vehicle in a well ventilated area.**

2. **Check engine idle speed.**
   - •Use the ▲ **UP** or ▼ **DOWN** arrow keys to change the Ideal RPM (engine speed). The vehicle should respond by matching the Ideal RPM.


Idle Speed Test

Actual RPM 0

Ideal RPM 800

3. **Return to the *Device Controls Menu*.**
   - •Press ◀◀ **BACK**.

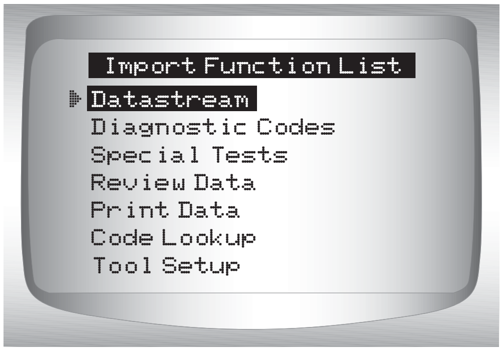
Section 8 – Import Diagnostics

IMPORT (OBD II) DIAGNOSTICS

IMPORT Function List

IMPORT All items marked with “-” are covered either in section 3 or 4. These items are not covered in this section.

✓ The ***IMPORT Function List*** is broken down into the following menus:


Import Function List
Datastream
Diagnostic Codes
Special Tests
Review Data
Print Data
Code Lookup
Tool Setup

- ❒ **Datastream Menu**
  - – View Data
  - – Record Data
  - – Review Data
  - – Print Data
  - – Tool Setup
- ❒ **Diagnostic Codes Menu**
  - ❒ Read Codes
  - – Pending Codes
  - – Erase Codes
  - – View Freeze Data
  - – Review Data
  - – Print Data
  - – Code Lookup
  - – Tool Setup
- – **Special Tests Menu**
  - – I/M Readiness
  - – Drive Cycle Monitor
  - – State OBD Check
  - – O2 Monitor Test
  - – On-Board Systems
  - – Vehicle Information
  - – Modules Present
  - – Review Data
  - – Print Data
  - – Tool Setup

(List Continued)

❒ **Review Data**

❒ **Print Data**

- •I/M Readiness
- •DTC (Codes)
- •Pending Codes
- •Freeze Frame
- •O2 Monitor Test
- •Diagnostic Monitor Tests
- •Vehicle Info
- •Playback
- •State OBD Check
- •Modules Present

✓ The following stored infromation can be reviewed for Import vehicles. Refer to ***Review Data*** and ***Print Data*** in the **Using the Scan Tool** section of this manual.

– **Code Lookup**

– **Tool Setup menu**

- – English/Metric
- – Display Contrast
- – Beeper
- – Setup User Key

✓ If an **Error Message** displays, make sure the OBD II connector is securely attached, and the ignition key is on. Cycle the ignition key to off for 10 seconds, then on. This may be required to reset the computer. If required, select yes to try again. If the problem still exists, refer to **Error Messages** on page 9-2.

Diagnostic Codes Menu

IMPORTANT Items marked with "-" are covered in section 3 of this manual. These items are not covered in this section.

❒ **Diagnostic Codes Menu**

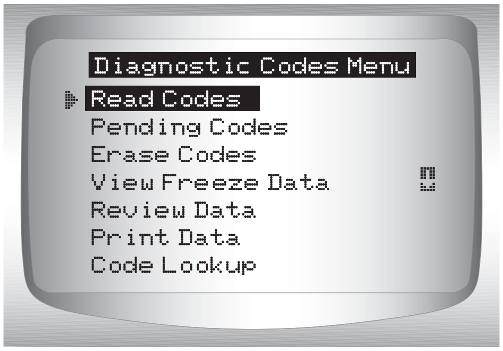
- ❒ Read Codes
- – Pending Codes
- – Erase Codes
- – View Freeze Data
- – Code Lookup
- – Review Data
- – Print Data
- – Tool Setup

Read Codes

✓ The ***Read Codes*** function allows the Scan Tool to read the DTCs from the vehicle's control modules. DTCs are used to help determine the cause of a problem or problems with a vehicle. These codes cause the control module to illuminate the malfunction indicator lamp (MIL) when emission-related or driveability fault occurs. MIL is also known as service engine soon or check engine lamp.

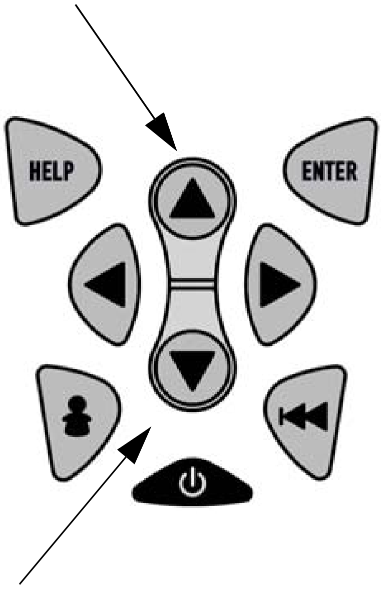
From ***Diagnostic Codes Menu***:

1. **Select *Read Codes.***
   - •Use ▲ **UP** or ▼ **DOWN** arrow key until ***Read Codes*** is highlighted.
   - •Press ⏎ **ENTER.**

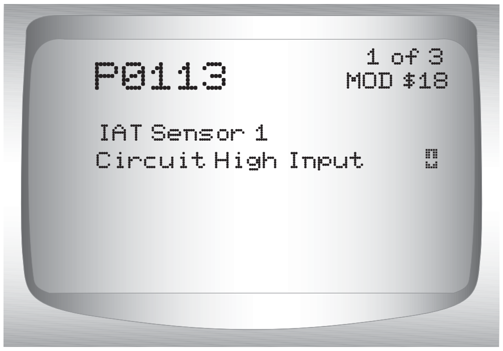

Diagnostic Codes Menu
Read Codes
Pending Codes
Erase Codes
View Freeze Data
Review Data
Print Data
Code Lookup

✓ If no DTCs are present a message stating ***System Pass: No Faults Detected*** is displayed.

2. **View and write down DTCs.**
   - •Use ▲ **UP** or ▼ **DOWN** arrow key.

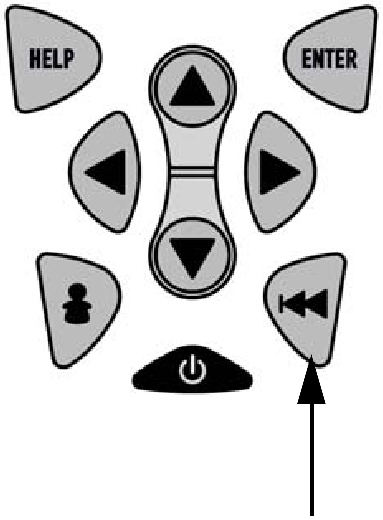


- ❐ In the example shown module (MOD) $18 is reporting the DTCs.


P0113
1 of 3
MOD $18
IAT Sensor 1
Circuit High Input

✓ On some Toyota vehicles the tool will show current and history DTC status information.

3. **Return to *Diagnostic Codes Menu.***
   - Press ⏮ **BACK** key.



Section 9 – Troubleshooting

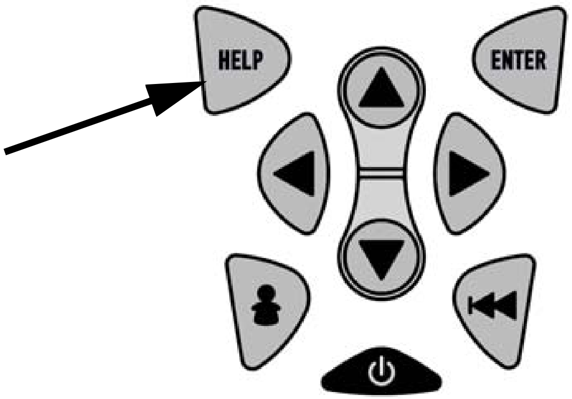
How to Use On-Line Help

Scan tool contains On-Line Help for specific Scan Tool screens, functions, and error messages.

✓ When icon (?) appears on the top of the display, On-Line Help is available.

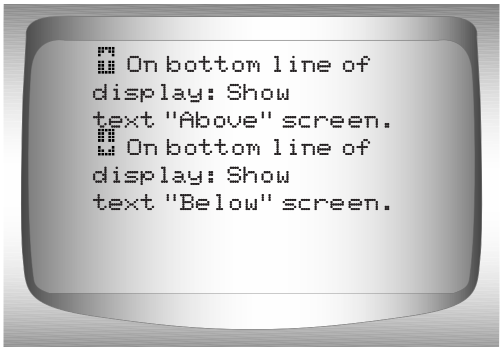
To Use **On-Line Help**:

1.Press HELP **Key.**



✓ Notice Text:

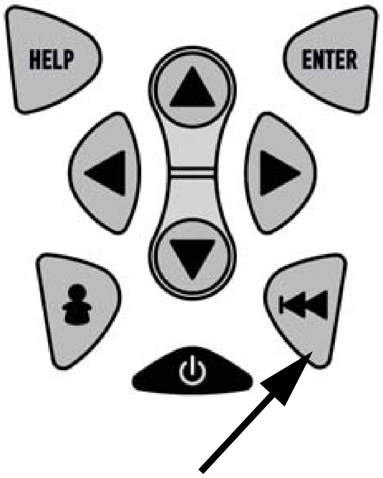
- ❒ Use ▲ **UP** or ▼ **DOWN** arrow key if required.



On bottom line of display: Show text "Above" screen.
On bottom line of display: Show text "Below" screen.

2. Return to original screen.

- Press **BACK** key.



Error Messages

Check the following if an error message displays:

- ❐ Verify ignition key is in the ON and not in the ACCESSORIES position.
- ❐ Make sure OBD II Cable is attached to vehicle's data link connector (DLC) and Scan Tool.
- ❐ Look at DLC and check for cracked or recessed pins, or for any substance that could prevent a good electrical connection.
- ❐ Test for continuity between the DLC wiring and the computer. In an extreme case, there may be a broken wire.
- ❐ Check for bent or broken pins.
- ❐ With the key on engine off (KOEO), check for blown fuses.
- ❐ Make sure the vehicle's control module has a good ground. If the computer case is grounded, then clean the connection and apply a conductive (dielectric) grease to the mating surfaces.
- ❐ With the KOEO, verify battery voltage is at least 8.0V
- ❐ Verify the control module is not defective. Refer to the service manual to diagnose the control module.

Scan Tool Does Not Power Up

✓ Review **Safety Precautions** before troubleshooting.

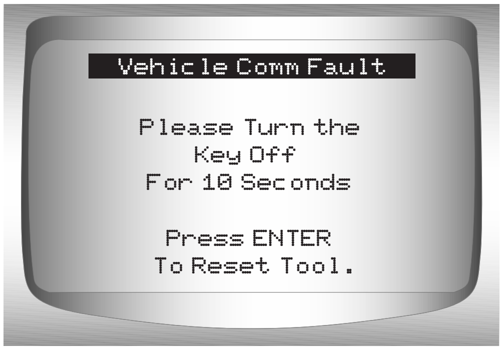
If Scan Tool will not power up, communicate with vehicle's control module, pass Scan Tool self-tests, or functions incorrectly in any other way, do the following:

- ❐ Check and replace the 9V battery if needed.
- ❐ Clean the DLC pins.
- ❐ Disconnect and reconnect DLC making sure it is connected correctly.
- ❐ Check vehicle battery to make sure at least 8.0 volts is present.
- ❐ Contact customer service.

Vehicle Communication Fault

The vehicle's control module(s) enters into an unrecoverable state.

1. **Turn vehicle key to off position.**
   - Wait 10 seconds.
   - Press **ENTER.**



Vehicle Comm Fault

Please Turn the
Key Off
For 10 Seconds

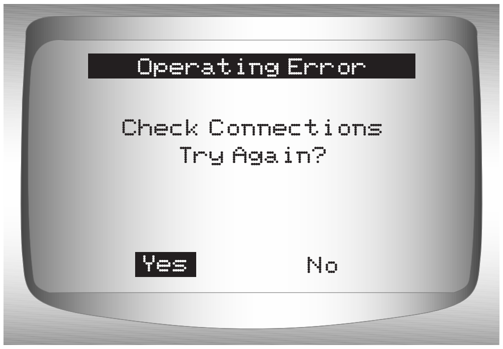
Press ENTER
To Reset Tool.

Operating Error or Erroneous Data.

An **Operating Error** or **Erroneous Data** occurs if vehicle's computer(s) stop(s) communicating with Scan Tool.

1.Make Selection

- Use ◀ **LEFT** or ▶ **RIGHT** arrow key.
- Press ENTER **ENTER.**



Operating Error

Check Connections
Try Again?

✓ See "**Error Messages**" on page 9-2 for possible causes.

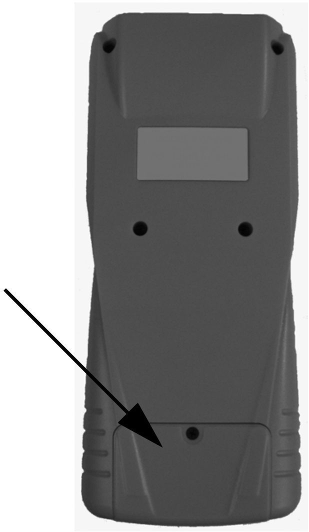
Battery Replacement

The Scan Tool requires 9V alkaline battery to operate without vehicle power.

✓ When the battery needs to be replaced, the low-battery icon (?) displays.

✓ Rechargeable batteries do not last as long as alkaline types and are not recommended.

✓ Non-rechargeable Lithium (Li) battery can be used. Though Lithium types last longer than the alkaline types, they are more expensive.



1. Place Display Face Down.
- On non-abrasive surface.

2. Remove Battery Cover.
- Turning phillips screw counterclockwise.
- Slide battery cover off.

3. Remove Battery and Properly Discard.

4. Install New Battery.
- 9V Alkaline Battery.

5. Reinstall Battery Cover.
- Slide battery cover on.
- Install phillips screw turning it clockwise.
- Do not overtighten screw.

Tool Self-Tests

Tool Self-Tests check the display, keys, and internal memory.

✓ Refer to **Using The Scan Tool** section of the manual for the operation procedures for Scan Tool self-tests.

Technical Support

- Toll-Free Number: **1-800-228-7667**.
- Website: **www.actron.com**.

Appendix A – PID Definitions

All global parameter identification data (PID) listed was verified on actual vehicles to guarantee accuracy. PID Definitions were obtained from reliable sources and are accurate at time of printing. It is possible that some newer vehicles may contain data different from that listed in Appendix A. Always refer to vehicle service manual for manufacturer specific PIDs.

The PID list is organized in alphabetical order — the same way the scan tool does. Remember, always refer to a vehicle service manual for detailed diagnostic procedures when troubleshooting incorrect PID values.

Types of Data Parameters

INPUT: These data parameters are obtained from sensor circuit outputs. Sensor circuit outputs are inputs to vehicle's PCM. For example, if Oxygen Sensor circuit was generating a 400mV signal, then scan tool would read O2S (v) 0.40.

OUTPUT: These data parameters are outputs or commands that come directly from computer module(s). For example; the ignition spark advance is controlled by PCM, on most vehicles, monitoring this PID shows spark output from PCM. The scan tool would display IGN ADV(º) 10.

CALCULATED: These data parameters are calculated after analyzing various inputs.

VALUE:the vehicle's computer module(s). For example, the engine load. The PCM calculates this from sensor inputs and displays it in a percentage.

PCM VALUE: Is information that is stored in the computer module(s)' memory and determined to be useful to service technician. An example of this is TROUBLE CODE value, the DTC that caused a freeze frame capture.

✓ **NOTE:** Several different causes can have the same parameter indication. For information on diagnostics consult vehicle service manuals.

DATA PARAMETER LIST

ABS FRP (0 - 65,5350 kPA) or (0 - 95050.5 psi)
Absolute Fuel Rail Pressure is the fuel pressure at the engine in respect to atmospheric pressure.

ABS LOAD (0 - 100%)
Absolute Load Value is the normalized value of air mass per intake stroke in percentage.

ABSLT TPS (0 - 100%)
Absolute Throttle Position represents normalized distance the throttle is opened.

ACC POS D,E or F (0 - 100%)
Accelerator Pedal Position represents normalized distance the gas pedal is pressed.

BARO PRESS (0 - 255 kPA) or (0 - 36.9 psi)
Barometric Pressure is usually received from a dedicated barometer, manifold absolute pressure sensor, and other inputs during certain modes of driving.

✓ The Baro Press may not exhibit the same value as weather services, which measure barometric pressure at sea level.

CALC LOAD (0 - 100%)
Calculated LOAD Value indicates the normalized load value on the engine.

CAT TEMPxy (- 40 – 6513.5ºC) or (- 40 – 9999.9ºF)
Catalyst Temperature displays the catalyst substrate temperature for a **Bank x** catalyst (if used by control module strategy for OBD monitoring) or displays the **Bank x Sensor y** catalyst temperature sensor.

CLR DST (0 – 65,535 km) or (0 – 40,722 miles)
Distance Since Cleared Diagnostic Codes is the distance driven since diagnostic trouble codes were erased.

CLR TIM (0 – 65,535 min) or (0 – 1092.25 hours)
Time Since Cleared Diagnostic Code is time since diagnostic trouble codes were erased.

CMD EQ RATxy (0 – 1.99)
Commanded Equivalence Ratio is the ratio of the air/fuel mixture.

- For systems that use conventional oxygen sensors, the commanded equivalence ratio displays in open loop. In closed loop, the value is 1.0.
- Fuel systems using wide-range/linear oxygen sensors display commanded equivalence ratio in both open and closed loop operation.

COOLANT (- 40 – 215ºC) or (- 40 – 419ºF)
Coolant displays engine coolant temperature (ECT) from a ECT sensor or cylinder head temperature sensor.

✓ Many diesel engines do not use either sensor and may substitute Engine Oil Temperature instead.

EGR CMD (0 – 100%)
Commanded Exhaust Gas Recirculation is the normalized percentage of exhaust gas being recirculated.

EGR ERR (-100 – 99.22%)
Exhaust Gas Recirculation Error shows the error from changing from one condition to another.

ENG RUN (0 – 65,535 sec.)
Time since Engine Start is the time the engine is running.

✓ ENG RUN stops when engine stalls or engine is turned off for any reason.

ENGINE (0 – 16,383.75 RPM)
Engine is the speed engine is running in revolutions per minute (RPM).

EQ RATxy
O2 Sensor Equivalence Ratio is used for linear or wide-ratio oxygen sensors for **Bank x Sensor y**.

EVAP REQ (0 – 100%)
Commanded Evaporative Purge is the position evaporative purge control valve is open in percentage.

EVAP VP (- 8192 – 8191 PA) or (- 32.8878 – 32.8838 H20)
Evaporative E missions System Vapor Pressure is pressure in the fuel tank

FUEL LVL (0 – 100%)
Fuel Level Input is the percentage of fuel with 0% equaling tank is full and 100% when tank is empty.

FUEL PRES (0 – 765 kPa) or (0 - 110 psi)
Fuel Rail Pressure is the fuel pressure at the engine when reading in reference to atmosphere pressure.

FUEL SYS (OPEN or CLSD)
Fuel System Status show loop status of fuel system banks.

OPEN:	Module is operating in Open Loop control strategy. The vehicle has not yet satisfied conditions for Module to go to closed loop.
CLSD:	PCM currently functioning in Closed loop control strategy, using O2 sensor(s) as feedback for fuel control
OPEN1:	Open Loop control strategy is being used by the PCM due to driving conditions. Driving conditions that may cause this to happen are power enrichment and deceleration enrichment.
OPEN2:	The PCM is operating in Open Loop control strategy due to detected system fault. Certain actuator or sensor faults will cause module to use an open loop strategy.
CLSD1:	Closed Loop control is cur-

rent storage being used by module, but a fault with at least one O2 sensor has been detected. The control system may be using single O2 for fuel control calculations.

IAT TEMP (- 40 – 215ºC) or (- 40 – 419ºF)
Intake Air Temperature is a measure of intake air temperature to determine correct air/fuel ratios and spark timing operations.

IGN ADV (- 64 – 63.5º)
Ignition Timing Advance for cylinder is a signal of how much spark advance to add to base engine timing (expressed in crankshaft degrees).

LT FL FTRM (-100 – 99.22%)
Long Term Fuel Trim Bank is the fuel mixture adjustment. The mixture can range, with midpoint being 0.

✓ Positive reading indicates module commanded a long-term rich mixture correction in response to a lean operating condition. A negative reading indicates module has commanded a long-term lean mixture in response to a rich operating condition.

MAF (0 – 655.35 g/s) or (0 – 86.5 lb/min)
Mass Air Flow Rate indicates the mass of air entering engine.

MAP (0 – 255 kPa) or (Hg)
Intake Manifold Absolute Pressure displays manifold pressure.

MIL DIST (0 – 65,535 km) or (0 – 40,722 miles)
Distance Traveled while Malfunction Indicator Lamp is Active is a counter that displays distance traveled since the MIL “or Check Engine or Service Engine Soon” light came on.

MIL STAT (ON or OFF)
Monitor Status Data Trouble Code state that module is commanding Malfunction Indicator Lamp to be on if problem exists.

MIL TIME (0 – 65,535 min) or (0 – 1092.25Hrs)
Distance Since Monitor Status Data Trouble Code is the distance traveled since the MIL “or Check Engine or Service Engine Soon” light came on.

O2Sxy (0 – 1.275V)
Oxygen Sensor Output Voltage is the voltage generated from the oxygen sensor to increase and decrease the amount of exhaust gas.

O2Sxy (- 128 – 127.996mA)
Oxygen Sensor Output Amp is used for linear or wide ratio oxygen sensors to increase and decrease the amount of exhaust gas

OBD2 STAT (CA, OBDI, US, NONE, EU and/or JA)
On Board Diagnostic shows what vehicle was made for.

CA - Indicates test vehicle meets California on board diagnostic ARB requirements

OBD I - Indicates test vehicle does not meet OBDII requirements.

US - Indicates test vehicle meets Federal EPA requirements.

NONE - Indicates test vehicle is not on board diagnostic compliant.

EU - Indicates test vehicle meets European on board diagnostic requirement.

JA - Indicates test vehicle meets Japanese on board diagnostic requirement.

OUTSID AIR (- 40 – 215ºC) or (- 40 – 419ºF)
Outside Air Temperature gives temperature outside.

PTO STATUS (OFF or ON)
Power Take Off Status allows module to keep track of Power at Take-Off.

REL FRP (0 – 5177.27 kPa) or (0 – 750. psi)
Relative Fuel Rail Pressure (Vacuum) is the fuel rail pressure at engine.

REL TPS (0 – 100%)
Relative Throttle Position is the normalized relative throttle position.

SECOND AIR (AIR_STAT: UPS, DNS or OFF)
Commanded Secondary Air Status is on newer vehicles and actuators to control pollution control.

UPS - UP STREAM module is demanding that secondary air be added at exhaust manifolds

DNS - DOWN STREAM module is demanding secondary air be added at catalytic converter

OFF - Module is demanding no secondary air to be added.

ST FTRMxy (- 100 – 99.22%)
Short-term Fuel Trim Bank calculated value represents the short-term relation of fuel metering on a fuel-injected engine.

✓ Short-term Fuel Trim calculated value that has a positive percentage is a rich fuel trim and if a negative percentage is present the fuel trim is lean.

ST FLTRMx (- 100 – 99.2%)
Short-term Fuel Trim value represents the short-term relation of fuel metering on a fuel-injected engine.

✓ Short-term Fuel Trim value with a positive percentage is a rich fuel trim and if a negative percentage is present the fuel trim is lean.

THR POS (0 – 100%)
Absolute Throttle Position is the position the throttle is located. The more the throttle is closed the less percent shown.

THROT CMD (0 – 100%)
Commanded Throttle Actuator Control is the position of the throttle. If throttle is closed the percent will be 0 and if wide open 100%.

TRIPS SNC CLR (0 – 255)
Number of warm-ups since diagnostic trouble codes cleared. Warm-up is when temperature of coolant rises to at least 22ºC (40ºF) from engine starting and reaching a minimum temperature of 70ºC (160ºF). In a diesel engine, the minimum temperature is 60ºC (140ºF.)

✓ If there is more than 255 that the engine warms up the TRIPS SNC CLR will remain at 255.

TROUB CODE (0000 – FFFF)
Trouble Code Parameter will give the diagnostic trouble code that caused a freeze frame capture. This information is helpful in diagnosing the cause of a driveability. If no freeze frame data has been captured, this PID will be zero.

VEH SPEED (0 – 255 K/h) or (0 – 158 mph)
Vehicle Speed shows the speed the vehicle is going.

VPWR (0 - 65.535V)
Control Module Voltage is the power input to the control module.

✓ Vehicles using a 42V battery may utilize multiple voltages of different systems. Therefore, the VPWR value may be significantly different than the battery.

PID List

All parameter identification data (PID) listed was verified on actual vehicles to guarantee accuracy. PID Definitions were obtained from reliable sources and are accurate at time of printing. It is possible that some newer vehicles may contain data different from that listed. Always refer to vehicle service manual for manufacturer specific PIDs.

The PID list is organized in alphabetical order — the same way the scan tool does. Remember, always refer to a vehicle service manual for detailed diagnostic procedures when troubleshooting incorrect PID values.

PID	Extended Description
#MISF LST 200	Number of Misfire last 200 Revs (Weighted)
#TRPS SNC MISF	Number of Trips Since the Time of Misfire
% GRADE	Percent Grade
1/2 FUEL CUT	50% Fuel Cut OFF Module
1-2 DES WOT	1-2 Shift Desired WOT RPM
1-2 ERROR	1-2 Shift Time Error
1-2 SFT	1-2 Shift Time
1-2 SOL	1-2 Shift Solenoid
1-2 SOL OSG	1-2 Shift Solenoid Open/Short To Ground
1-2 SOL STP	1-2 Shift Solenoid Short To Volts
1-2 WOT APT	1-2 Shift WOT RPM Adapt
1-2APT HICEL	1-2 Adapt High Cell
1-2APT LOCEL	1-2 Adapt Low Cell
1-4 SFT SOL	1-4 Shift Solenoid
12V REF	12 Volt Reference Voltage
1ST GEAR SW	1st Gear Switch
2-1 SHIFT	2-1 Shift Time
2-3 ERROR	2-3 Shift Time Error
2-3 GEAR LOCK	2-3 Gear Lock
2-3 SFT	2-3 Shift Time
2-3 SHIFT	2-3 Shift Time
2-3 SOL	2-3 Shift Solenoid
2-3 SOL OSG	2-3 Shift Solenoid Open/Short To Ground
2-3 SOL STP	2-3 Shift Solenoid Short To Volts
2-3APT HICEL	2-3 Adapt High Cell
2-3APT LOCEL	2-3 Adapt Low Cell
2-4 SOL	2-4 Solenoid
2-4/LR PRES SW	2 - 4 2-4/LR Pressure Switch
2-4KICK-L/R CL	2 - 4 Kickdown or Low / Reverse - Reverse Clutch
2/4 CL VOL IND	2/4 Clutch Volume Index
24X SENSOR	24x Sensor RPM
24X CKP SEN	24 Times Crankshaft Sensor
2-5 LAST CODE	ID 2-5 to Last Code Received
25 MPH REACHED	25 Miles Per Hour Reached
2C CL VOL IND	2C Clutch Volume Index
2C CLUTCH ST	2C Clutch State
2C PRESS SW	2C Pressure Switch
2C SOL	2C Solenoid
2GR START LMP	2 GR Start Lamp
2ND FUEL PUMP	2nd Fuel Pump Relay Control
2ND GEAR SW	2nd Gear Switch

PID	Extended Description
2ND TRIP FT	2nd Trip With Same Fuel Trim
2ND TRIP MISF	2nd Trip With Same Misfires
2WD HIGH LGHT	2 Wheel Drive High Indicator Light
3-2 SFT	3-2 Downshift
3-2 SFT ENABLE	3-2 Downshift Solenoid Enable
3-2 SHIFT	3-2 Shift Time
3-2 SOL PWM	3-2 Downshift Solenoid PWM
3-4 ERROR	3-4 Shift Time Error
3-4 SFT	3-4 Shift Time
3-4 SHIFT	3-4 Shift Time
3-4APT HICEL	3-4 Adapt High Cell
3-4APT LOCEL	3-4 Adapt Low Cell
3RD GEAR SW	3rd Gear Switch
3X ENG ACT	3x Engine Speed Activity
4-3 SHIFT	4-3 Shift Time
4C CLUTCH ST	4C Clutch State
4C PRESS SW	4C Pressure Switch
4C SOL	4C Solenoid
4TH GEAR SW	4th Gear Switch
4WD	4 Wheel Drive
4WD HIGH LIGHT	4 Wheel Drive High Indicator Light
4WD LOW	Low Speed WD
4WD LOW LIGHT	4 Wheel Drive Low Indicator Light
4WD MODE	4-wheel Drive Mode Signal
4X BETWEEN CAM	4X Refrence Between Cam Counter
4X REF CNT	4X Reference Pulse Counter
4X4L	Low Speed 4WD
5V REF A	5 Volts Reference A
5V REF B	5 Volts Reference B
5V REF AUX	Auxillary 5 Volt Output
5V REF PRI	Primary 5 Volt Output
A.I.R. PUMP	Air Injection Reactor Pump Relay Control
A/C CLCH REL	Air Conditioning Clutch Relay
A/C CLUTCH	Air Conditioning Clutch
A/C CLUTCH RLY	Air Conditioning Clutch Relay
A/C COMMAND	Commanded A/C
A/C COMPRESSOR	Air Conditioning Compressor
A/C CUTOUT RLY	Air Conditioning Cutout Relay
A/C EVAP	A/C Evaporative Temperature
A/C PRES	A/C Pressure
A/C PRESS	A/C Pressure A/D
A/C PSI DISAB	A/C Psi Disable
A/C RELAY	Air Conditioning Clutch Relay
A/C REQ	A/C Requested
A/C REQUEST SW	Air Conditioning Requested
A/C RLY COM	Air Conditioning Relay Command
A/C RLY DR H	Air Conditioning Relay Driver High
A/C RLY DR L	Air Conditioning Relay Driver Low
A/C RLY OSG	Air Conditioning Relay Circuit Open/Short To Ground
A/C RLY STP	Air Conditioning Relay Circuit To Volts
A/C SELECT SW	Air Conditioning Select Switch
A/C SLUGGING	A/C Slugging
A/C STATUS	A/C Status
A/D INPUT	A/D Input

PID	Extended Description
A/F DESIRED	A/F Ratio
A/F RATIO	Air Fuel Ratio
ABS EBTCM	Anti Braking System Electronic Body Traction Control Module
ABS EN RELAY	Anti Braking System Engage Relays
ABS FAIL LT	Anti Braking System Fail Light
ABS FRP	Absolute Fuel Rail pressure
ABS IGNITION	Anti Braking System Ignition
ABS LOAD	Absolute Load
ABS LT FLASH	Anti Braking System Light Flashing
ABSLT TPS (%)	Absolute Throttle Position Sensor
ABS MODE	Anti Braking System Mode
ABS RELAY	Anti Braking System Relay
ABS WARN LT	Anti-Lock Braking System Warning Light
AC CLUTCH	Air Conditioner Clutch Relay Control
AC ENABLED	Air Conditioner Enabled
AC EVAP(°F)/(°C)	Air Conditioner Evaporator Temperature
AC FAN REQST	Air Conditioner Fan Request
AC HEAD PRES	Air Conditioner Head Pressure
AC HI PRES SW	A/C Hi Pressure Switch
AC HIGHSIDE	A/C Highside Temperature
AC HIS PR	Air Conditioning High Side Pressure
AC LOWSIDE	A/C Lowside Temperature
AC PL/GUL	Accumulated Time In Park Lock and Gradual Unlock
AC PR OUT RNG	A/C Pressure Out of Range
AC PRES(PSI)/(KPA)	Air Conditioner Refrigerant Pressure
AC PRES(V)	Air Conditioner Refrigerant Pressure Sensor
AC PRESS SW	Air Conditioner Refrigerant Pressure Switch
AC RELAY	A/C Relay
AC REQUEST	Air Conditioner Request Switch
ACC POS D	Accelerator Pedal D
ACC POS E	Accelerator Pedal E
ACC POS F	Accelerator Pedal F
ACCS	A/C Cyclic Switch
ACL SIGNAL	ACL Signal
ACP	A/C Pressure
ACPSW	A/C Pressure Switch
ACT	Air Charge Temperature
ACT A/D	Air Charge Temperature Analog to Digital Reading
ACT AIS POS	Actual AIS Motor Position
ACT GAS FLW	Actual Gas Flow
ACTUAL TPS	Actual Throttle Position
ACTUATOR TST	Actuator Test
ADD ADPT FUEL	Adaptive Adjustment of Fuel Injector
ADD APT FUEL2	Adaptive Adjustment of Fuel Injector Bank 2
ADD FUEL2	Adaptive Adjustment of Fuel Injector Bank 2
ADDED FUEL	Adaptive Adjustment of Fuel Injector
ADPT FUEL (%)	Adaptive Fuel Factor
ADPT FUEL1-2 (%)	Adaptive Fuel Factor Bank 1-2
ADPT KNOCK	Adaptable Knock Retard
ADPT SHIFT	Adaptable Shift
AIR ASSIST SOL	Air Assist Solenoid
AIR DIVRT SOL	Air Divert Solenoid Control
AIR MOTOR O/C	Air Motor O/C
AIS MTR POS	Automatic Idle Speed Motor Position

A

PID	Extended Description
AIR PUMP	Air Pump
AIR PUMP RELAY	Air Pump Relay
AIR PUMP SOL CMD	Air Pump Solenoid Comand
AIR SOLENOID	Air Solenoid
AIR STAT	Air Status
AIR SWITCH	Air Switch
AIR SW SOL	Air Switch Solenoid Control
AIS POS REQ	Automatic Idle Speed Position Request
AIS POSITION	Automated Idle Speed Position
ALCH CTNT	Fuel Alcohol Content
ALCOHOL(%)	Alcohol Concentration In Fuel
ALL SOL/REL	All Solenoids/Relays
ALL SOLS/RELS	All Solenoids/Relays
Alt F-Term	Alternator F-terminal A/D
ALT FIELD	Alternator Field
AMB/BAT A/D	Battery/Ambient Temperature Analog to Digital Reading
AMB/BAT S/N	Ambient Battery Serial Number
AMB/BATSNS	Ambient Battery Serial Numbers
AMB/BATT	Ambient/Battery Temperature
AMB AIR TEMP(V)	Ambient Air Temperature
APP 1	Accelerator Pedal Position Sensor 1
APP 2	Accelerator Pedal Position Sensor 2
APP 3	Accelerator Pedal Position Sensor 3
APP ANGLE	Accelerator Pedal Position Angle
APP AVG	Applied Pedal Position Average
APP IND	Accelerator Pedal Indicated Angle
APP MY	Application Model Year
ASD FUEL SYS	Auto Shutdown Fuel System
ASD RELAY	Auto Shutdown Relay
ASD RELAY SNS	Auto Shutdown Relay Sense
ATC SLIP	Auto Traction Control Slip Speed
AUTO 4WD LGHT	Auto 4 Wheel Drive Indicator Light
AUTO LRN TMR	Auto Learn Timer
AUTOSTK	Autostick Vehicle
AUTOSTK DWNS	Autostick Downshift
AUTOSTK GEAR	Autostick Gear Position
AUTOSTK/OD LO	Autostick / OverDrive Lock-Out
AUTOSTK UPS	Autostick Upshift
AUX FAN	Auxillary Fan
AVG BPW BK1	Average Bank Pulse Width Bank 1
AVG BPW BK2	Average Bank Pulse Width Bank 2
AWD ENBL	All Wheel Drive Enabled
B1 CL1 O2FDB	Bank 1 (Left) Closed Loop (Mode 1) Normal O2S Feedback
B1 CL2 O2SF	Bank 1 (Left) Closed Loop (Mode 2), Fault with 1 O2S
B1 OL NC	Bank 1 (Left) Open Loop Condition Not Yet Met
B1 OL2 DR	Bank 1 (Left) Open Loop (Mode 2) Due To Driving Conditions
B1 OL3 FLT	Bank 1 (Left) Open Loop (Mode 3) Due To System Fault
B2 CL1 O2FDB	Bank 2 (Right) Closed Loop (Mode 1) Normal O2S Feedback
B2 CL2 O2SF	Bank 2 (Right) Closed Loop (Mode 2) Fault with 1 O2S
B2 OL NC	Bank 2 (Right) Open Loop Condition Not Yet Met
B2 OL2 DR	Bank 2 (Right) Open Loop (Mode 2) Due To Driving Conditions
B2 OL3 FLT	Bank 2 (Right) Open Loop (Mode 3) Due To System Fault
BAD CYL ID	Bad Cylinder Identification
BAL BYPSS REL	Ballast Bypass Relay

PID	Extended Description
BARO	Barometric Pressure
BARO PRESS	Barometric Pressure
BARO(V)/("HG)/(KPA)	Barometric Pressure
BARO PRS	Barometric Pressure Sensor
BARO READ	Barometric Pressure Reading
BARO READ SOL	Barometric Pressure Solenoid
BARO SOL	Barometric Pressure Solenoid
BARO UPDT	Barometric Pressure Read Update
BAT TRM OFFSET	Battery Transmission Offset
BATT ECM	Battery Voltage measured by Engine Control Module (CM551)
BATT TCM	Battery Voltage measured by Transmission Control Module
BATT TEMP(°F)/(°C)	Battery Temperature
BATT TEMP(V)	Battery Temperature Sensor
BATT VOLTS	Battery Voltage
BATTERY (V)	Battery Voltage
BLM (BLM L & R)	See LT FUEL TRIM
BLM CELL	See LT FUEL TRANSMISSION CL
BLM ENABLED	See LT FUEL TRANSMISSION EN
BLM FINAL	Block Learn Memory Final
BLST BP RLY	Ballast Bypass Relay
BOO	Brake On/Off
BOO-BRAKE SW	Brake On/Off Switch
BOO/BPP	Brake ON / OFF
BOOST (KPA)/(PSI)	Boost Pressure
BOOST(%)/("HG)/(KPA)	Turbocharger Boost Pressure
BOOST GOAL	Boost Pressure Goal
BOOST PRES	Boost Pressure
BOOST SOL	Boost Solenoid Pulse Width Module
BRAKE F LVL	Brake Fluid Level Switch
BRAKE FLUID	Brake Fluid
BRAKE SW	Brake Switch
BRAKE SW CKT	Brake Switch Circuit
BRAKE SWITCH	Brake Switch
BRAKE WARN LT	Brake Warning Light
BRK BST VAC	Brake Booster Vacuum
BRKBST VAC	Brake Booster Vacuum
BRK OFF DELAY	Brake Off Delay
BRK TELLTALE	Brake Telltale
BRK TRQ TST	Brake Torque Test
BRK WARN CKT	Brake Warning Circuit
BST GOAL	Turbocharger Boost Pressure Goal
BST PRES	Turbocharger Boost Pressure
BST REQ("HG)/(KPA)	Turbocharger Boost Pressure Requested
C1 PRES SW	C1 Pressure Switch
C2 PRES SW	C2 Pressure Switch
C3	C3
C3 PRES SW	C3 Pressure Switch
C4	C4
C4 PRES SW	C4 Pressure Switch
C5 PRES SW	C5 Pressure Switch
CAL AC LD	Calculated A/C Load
CAL POT ADJST	Calibration Potentiometer Adjustment
CALC CNVRT	Calculated Converter Temperature
CALC CONVERT	Calculated Converter Temperature

PID	Extended Description
CALC ECT	Calculated Engine Coolant Temperature
CALC FLOW	Calculated Flow
CALC LOAD (%)	Calculated Engine Load
CALC VAC	Calculated Engine Vacuum
CALPOT MULTIPL	Calibration Potentiometer Multiple
CAM DC	Camshaft Position Commanded Duty Cycle
CAM EDGE CNT	Camshaft Edge Counter
CAM EDGE CNTR	Camshaft Edge Counter
CAM ENG SPD	Cam Engine Speed Activity
CAM ERR	Camshaft Position Error
CAM INPUT HI-LOW	Cam Signal Input - High To Low
CAM INPUT LOW-HI	Cam Signal Input - Low To High
CAM RE-SYNC	Cam Re-syncs Counter
CAM RETARD	Cam Retard
CAM SIG PRES	Cam Signal Present
CAM SIG PRESENT	Cam Signal Present
CANPRG DR H	Canister Purge Driver High
CANPRG DR L	Canister Purge Driver Low
CANST PURGE	Canister Purge Solenoid Control
CAT	Catalyst Temperature or Catalyst Temperature Sensor Voltage
CAT EWMA	Catalyst Test Time Difference
CAT F THR	Catalyst Test Fail Threshold
CAT MON	Catalyst Monitor
CAT MON CT	Catalyst Monitor EWMA Sample Counter Bank
CAT MON CT1	Catalyst Monitor EWMA Sample Counter Bank 1
CAT TEMP 11	Cataltic Converter Temperature Bank 1, Sensor 1
CAT TEMP 12	Cataltic Converter Temperature Bank 1, Sensor 2
CAT TEMP 21	Cataltic Converter Temperature Bank 2, Sensor 1
CAT TEMP 22	Cataltic Converter Temperature Bank 2, Sensor 2
CAT TEST B1	Number OfCatalyst Test - Bank 1
CAT1 CAL THRS	Steady-state Catalyst Monitor Threshold, Bank1
CAT1 STDY ST	Steady-state Catalyst Monitor, Bank1
CAT2 CAL THRS	Steady-state Catalyst Monitor Threshold, Bank 2
CAT2 STDY ST	Steady-state Catalyst Monitor, Bank 2
CAT1CAL THR	Steady-state Catalyst Monitor Threshold, Bank1
CAT1STDY ST	Steady-state Catalyst Monitor, Bank1
CAT2STDY ST	Steady-state Catalyst Monitor, Bank2
CATALYST MON	Catalyst Monitor Completed This Driving Cycle
CATLST PASSED/FAILED	Catalyst Test Passed / Failed
CAT MON CT1	Catalyst Monitor EWMA Sample Counter Bank 1
CATMON AVG	TWC Monitor Average Deviation Difference Failure Threshold
CATMON CPLT	Number Of Catalyst Monitors Test Complete
CC HOLD	Cruise Control Hold Mode
CC ON/OFF SW	Cruise Control On/Off Switch
CC RES/ACC SW	Cruise Control Resume/Accelerate Switch
CC SERVO(%)	Cruise Control Servo Position
CC SET(MPH)/(KPH)	Cruise Control Set Speed
CC SET/CST SW	Cruise Control Set/Coast Switch
CC SRVO REQ(%)	Cruise Control Servo Position Requested
CC VACUUM SOL	Cruise Control Vacuum Solenoid Control
CC VENT SOL	Cruise Control Vent Solenoid Control
CCC	CCC
CCP DUTY(%)	See EVAP DUTY
CCP SOL	Carbon Canister Purge Solenoid PWM

PID	Extended Description
CCP SOLENOID	See EVAP SOLENOID
CCS	Coast Clutch Switch
CHARG GOAL (V)	Charging System Goal
CHAS PITCH	Powertrain Induced Chassis Pitch
CHK ENG LAMP	See MIL
CHK ENG LIGHT	See MIL
CHRG GOAL (V)	Charging System Goal
CHRG TEMP(°F)/(°C)	Compressed Natural Gas Temperature Sensor
CHRG TEMP(V)	Compressed Natural Gas Temperature
CHT	Cylinder Head Temperature
CKP	Crankshaft Position Sensor Signal Detected
CKP ACT CNT	Crankshaft Active Counter
CKP ENGINE	Crankshaft Position Sensor Engine Speed
CKP LRES AG	Crankshaft Position Sensor Low Resolution Angle
CL SNC RESTART	Clear Since Restart
CLEAR FLOOD	Clear Flood Function
CLNT STRT	Coolant Start Temperature
CLR DST	Distance Since Cleared
CLR TIM	Minites Ran Since Erased
CLUTCH INT SW	Clutch Interlock Switch
CLUTCH SW	Clutch Pedal Switch
CLUTCH UPS SW	Clutch Upstop Switch
CMD EQ RAT	Commanded Equivalence Ratio
CMP	Crankshaft Position Sensor Signal Detected
CMP/CKP RLTD ANG	Camshaft To Crankshaft Relationship Angle
CMP/CKP SYNC	Camshaft To Crankshaft Syncronization Detected
CMP ACT CNT	Camshaft Active Counter
CNG PRES	Compressed Natural Gas Pressure
CNG PRES	Compressed Natural Gas Pressure
CNG PRESS (PSI)	Compressed Natural Gas Pressure
CNG PRESS(V)	Compressed Natural Gas Pressure Sensor
CNG TEMP(°F)/(°C)	Compressed Natural Gas Temperature
CNG TEMP(V)	Compressed Natural Gas Temperature Sensor
CODE1 ODO	Odometer When 1st Code Set Since Cleared
COLD START	Cold Start Up
COMMD FAN 1	Commanded Fan 1
COMMD FAN 2	Commanded Fan 2
COMP COMP MON	Comprehensive Components Monitor Completed This Driving Cycle
COOLANT (°F)/(°C)	Engine Coolant Temperature
COOLANT (V)	Engine Coolant Temperature Sensor
COOLANT CALC	Calculated Engine Coolant Temperature
COOLANT GAUGE	Coolant Gauge
COOLANT LEVL	Eng Coolant Level
COOLANT SW	Coolant Switch
CORROSIVITY(V)	Corrosivity
CPP/TCS	Clutch Engaged / Overdrive Switch Pressed
CRANK EDGE CNT	Crankshaft Edge Counter
CRANK EDGE CNTR	Crankshaft Edge Counter
CRANK LRND	Crankshaft Learnd
CRANK MISS	Crank Ref Missed Diesel
CRANK REQ	Crank Requested
CRANK SWITCH	Crank Switch
CRANKING A/F	Cranking Air/fuel Ratio
CRANKING(RPM)	Cranking RPM

PID	Extended Description
CRUISE	Cruise
CRUISE CANCEL SW	Speed Control Cancel
CRUISE COAST SW	Speed Control Coast
CRUISE DIF	Delta From Speed That Cruise Control Is Set At
CRUISE ENGAG	Cruise Engaged
CRUISE IND LAMP	Cruise Control Engaged Lamp
CRUISE INHIB	Cruise Inhibited
CRUISE ON/OFF SW	Speed Control ON/OFF
CRUISE RESUME SW	Speed Control Resume
CRUISE SET SW	Speed Control Set
CRUISE SPD	Speed Cruise Control Is Set At
CRUISE SW	Cruise Control Switch A/D Voltage
CRUISESET (MPH)/(KPH)	Cruise Control Set Speed
CRUZ DRV H	Cruise Driver High
CRUZ DRV L	Cruise Driver Low
CRZ CLUTCH CMND	Cruise Clutch Command
CRZ OFF BRAKE	Cruise Deactivated By Brake
CRZ REL STATE	Cruise In Release State
CRZ RSM/ACCL	Cruise Resume / Acceleration Switch
CRZ SET/COAST	Cruise Set / Coast Switch
CRZ TRAC ACT	Cruise Traction Control Active
CRZ VLTS OORNG	Cruise Volts Out of Range
CUR APT CELL	Current Adaptive Cell
CUR APT MEM	Current Adaptive Memory
CUR IAC MEM	Current Idle Air Control Memory
CUR IAC POS	Current Idle Air Control Position
CUR MALFS	Number of Current Malfunction
CUR THROT ANT	Output Shaft Speed
CUR TRANS DTC	Current Transmission Diagnostic Trouble Codes Are Set
CURRENT GEAR	Current Gear
CYC MIS DATA	Cycles of Misfire Data
CYL 1 MISF	Cylinder 1 Misfire
CYL 2 MISF	Cylinder 2 Misfire
CYL 3 MISF	Cylinder 3 Misfire
CYL 4 MISF	Cylinder 4 Misfire
CYL 5 MISF	Cylinder 5 Misfire
CYL 6 MISF	Cylinder 6 Misfire
CYL 7 MISF	Cylinder 7 Misfire
CYL 8 MISF	Cylinder 8 Misfire
CYL 9 MISF	Cylinder 9 Misfire
CYL 10 MISF	Cylinder 10 Misfire
CYL 1 MISF CNT	Cylinder 1 Misfire Counter (Weighted)
CYL 2 MISF CNT	Cylinder 2 Misfire Counter (Weighted)
CYL 3 MISF CNT	Cylinder 3 Misfire Counter (Weighted)
CYL 4 MISF CNT	Cylinder 4 Misfire Counter (Weighted)
CYL 5 MISF CNT	Cylinder 5 Misfire Counter (Weighted)
CYL 6 MISF CNT	Cylinder 6 Misfire Counter (Weighted)
CYL 7 MISF CNT	Cylinder 7 Misfire Counter (Weighted)
CYL 8 MISF CNT	Cylinder 8 Misfire Counter (Weighted)
CYL 9 MISF CNT	Cylinder 9 Misfire Counter (Weighted)
CYL 10 MISF CNT	Cylinder 10 Misfire Counter (Weighted)
CYL 1 MISFIRE	Cylinder Misfire
CYL 2 MISFIRE	Cylinder Misfire
CYL 3 MISFIRE	Cylinder Misfire

PID	Extended Description
CYL 4 MISFIRE	Cylinder Misfire
CYL 5 MISFIRE	Cylinder Misfire
CYL 6 MISFIRE	Cylinder Misfire
CYL 7 MISFIRE	Cylinder Misfire
CYL 8 MISFIRE	Cylinder Misfire
CYL ID	Cylinder Identification
CYL KNKRET	Cylinder Knock Retard
CYL MDE MIS	Cylinder Mode Misfire Index
CYL MISFIRE	Cylinder Misfire
CYLINDER AIR	Cylinder Air
CYLS PASSED/FAILED	Cylinders Failed Or Passed
DBL STRT OVRD	Double Start Override
DCL FL MDE	Decal Fuel Mode
DECAL EWMA	Decal EWMA
DECEL FL MDE	Decel Fuel Mode
DEFROST SW	Defrost Switch
DES CYL AIR	Desired Cylinder Air
DES EGR POS	Desired Linear EGR Position
DES G FLOW	Desired Gas Mass Flow
DES IAC	Desired Intake Air Control
DES IDLE	Desired Idle Speed
DES INJ TIM	Desired Diesel Injection Pump Timing
DES L PRS	Desired Lime Pressure
DES TORQUE	Desired Torque Level
DIESLE EGR SYSTEM	Diesle Exhaust Gas Recirculation System
DIS CYL EVENT	Distributorless Ignition System Cycle Event
DIS CYC EVENT	Distributorless Ignition System Cycle Event
DIS SEN STAT	Distributorless Ignition System Sensor Status
DIS SIG STAT	Distributorless Ignition System Signal Status
DLV ENG TR	Delivered Engine Torque
DLV TR DR H	Delivered Torque Driver High
DLV TR DR L	Delivered Torque Driver Low
DPF EGR	Delta Pressure Feedback EGR Pressure Sensor
DRIVER	Driver 1
DS DESIRED	Down Shift Desired
DS IN PROG	Down Shift In Progress
DS REQ	Down Shift Requested
DSL EGR SYS	Diesle Exhaust Gas Recirculation System
DTC CNT	Total Number of Fault Codes And Pending Codes
DTC THIS IGN	DTC Set This Ignition
ECBM VOLTS	Electronic Control Braking Module Voltage
ECL LOW LAMP	Low Engine Coolant Level Lamp
ECT	Ect Engine Coolant Temperature
ECT A/D	Engine Coolant Temperature Sensor Analog To Digital Reading
ECT AT MISF	Engine Coolant Temperature at Misfire
ECT GAUGE	Engine Coolant Temperature Gauge
ECT SENSOR(V)	Engine Coolant Temperature Sensor Voltage
ECT STARTUP	Engine Coolant Temperature at Start Up
ECT STRTUP	Engine Coolant Temperature at Start Up
ECT TCM	Engine Coolant Temperature TCM
ECT TEMP (°F)/(°C)	Engine Coolant Temperature
ECU RST INIT	Electronic Control Unit Reset - Initialized
ECU RST-2X LOSS	Electronic Control Unit Reset - 2X Buss Loss
ECU RST-BATT L	Electronic Control Unit Battery Loss

PID	Extended Description
ECU RST-CLK L	Electronic Control Unit Reset - Clock Loss
ECU RST-EXT	External Electronic Control Unit Reset
ECU RST-INST	Electronic Control Unit Reset Instructions
ECU RST-SRC UNK	Electronic Control Unit Reset Source Unknown
ECU RST-WDOG	Electronic Control Unit Reset Watchdog
EFE SOLENOID	Early Fuel Evaporation Solenoid
EGR	EGR Switch
EGR ACTUAL	Actual Exhaust Gas Recirculation Position
EGR CL VLV F	Exhaust Gas Recirculation Closed Valve Fault
EGR CLS POS	Linear EGR Closed Valve Pintel Position
EGR CMD	Commanded Exhaust Gas Recirculation
EGR COM POS	Linear EGR Commanded Position
EGR COMMAND	EGR Valve Solenoid Command
EGR DC	EGR Duty Cycle
EGR DCL EWMA	Exhaust Gas Recirculation Decal EWMA
EGR DIAG SW	EGR Valve Diagnostic Flow Switch
EGR DLT MAP	EGR Delta MAP Calculation
EGR DUTY(%)	EGR Valve, Control Signal Duty Cycle
EGR ERR	Exhasust Gas Recirculation Error
EGR FAIL MODE	EGR System In Failure Mode
EGR FDBACK	Linear EGR Feedback A/D
EGR LOOP	Exhaust Gas Recirculation Loop Status
EGR MONITOR	EGR Monitor Completed This Driving Cycle
EGR NORM	Linear EGR Normalized
EGR OPN/SHRT	Exhaust Gas Recirculation Open or Shorted
EGR P DLT	Exhaust Gas Recirculation Pressure Delta
EGR PINT ERR	EGR Pintel Position Error
EGR POS	Exhaust Gas Recirculation Solenoid Position
EGR POS D	Exhaust Gas Recirculation Delta
EGR POS FLT	Exhaust Gas Recirculation Fault
EGR PWM STATE	Exhaust Gas Recirculation PWM State
EGR REQ("HG)/(KPA)	Requested Manifold Pressure For Desired EGR Flow
EGR REQ(%)	EGR Valve, Requested Flow
EGR SOL 1	EGR Valve Solenoid Control
EGR SOL 2	EGR Valve Solenoid Control
EGR SOL 3	EGR Valve Solenoid Control
EGR SOLENOID	Exhaust Gas Recirculation Solenoid
EGR STFT F	Exhaust Gas Recirculation Short Term Fuel Trim Fail Threshold
EGR TEMP SW	EGR Valve, Flow Temperature Switch
EGR TEMP(V)	EGR Valve, Flow Temperature Voltage
EGR TEST CNT	EGR Test Count
EGR TRIP SMP	EGR Trip Samples
EGR VENT SOL	Exhaust Gas Recirculation Vent Solenoid
EGR VLV POS	EGR Valve Position
EGR VR DC	EGR Duty Cycle To Electronic Vacuum Regulator
ENG CLNT TEMP	Engine Coolant Temperature
ENG LOAD	Engine Load
ENG OIL LEVL	Eng Oil Level
ENG OIL LIFE	Engine Oil Life
ENG OIL PRES	Engine Oil Pressure
ENG RUN	Engine Run Time
ENG SHTOFF	Engine Shutoff Solenoid
ENG SPD OUT	Engine Speed Output
ENG OIL TMP	Engine Oil Temperature

PID	Extended Description
ENG TOR	Engine Torque
ENGINE	Engine Speed
ENGINE (RPM)	Engine RPM
ENGINE OIL	Engine Oil
ENGINE RPM	Engine Speed
ENGINE RPM/MPH	Engine RPM/MPH Ratio
ENGOILPRES	Engine Oil Pressure
ENH EVAP FLT	Enhanced Evaporative Fault History
EOP LOW LAMP	Low Engine Oil Pressure Lamp
EPC	Electronic Pressure Control
EPR SOL	EPR Solenoid
EQ RAT	Oxygen Sensor Equivalence Ratio (Bank X / Sensor Y)
ERR 1-2 SFT	Shift Time Error For 1-2 Shift
ERR 2-3 SFT	Shift Time Error For 2-3 Shift
ERR 3-4 SFT	Shift Time For Error For 3-4 Shift
ERR LST SFT	Shift Time Error For Latest Shift
ESC ACT CNT	Electronic Spark Control Active Counter
ESC COUNTER	See KS COUNTER
ESC FAILURE	See KS FAILURE
ESC HI ADPT INT	High ESC Adaptive Integer Term
ESC LOW ADPT INT	Low ESC Adaptive Integer Term
ESC MID ADPT INT MID	ESC Adaptive Integer Term
ESC MIN NSE	ESC Minimum Learned Noise Voltage
ESC NOISE	ESC Noise Channel
EST BYPASS	See IC BYPASS
EST ENABLED	See IC ENABLED
EST1 A/D AT FAIL	Est1 A/D Volts at Fail
EST2 A/D AT FAIL	Est2 A/D Volts at Fail
ETHANOL CONT	Ethanol Content %
ETHROT PEDALPOS1	Electronic Throttle Control Pedal Position Sensor 1 Angle
ETHROT PEDALPOS2	Electronic Throttle Control Pedal Position Sensor 2 Angle
ETHROT PEDALPOS3	Electronic Throttle Control Pedal Position Sensor 3 Angle
ETHROT POS IN	Electronic Throttle Control Indicated Throttle Position
ETHROT POS INDC	Electronic Throttle Control Indicated Throttle Position
ETHROT THROTPOS1	Electronic Throttle Control Throttle Position Sensor 1 Angle
ETHROT THROTPOS2	Electronic Throttle Control Throttle Position Sensor 2 Angle
ETHRO THRPOS1	Electronic Throttle Control Throttle Position Sensor 1 Angle
ETHRO THRPOS2	Electronic Throttle Control Throttle Position Sensor 2 Angle
EVAP DC	Evaporative Duty Cycle
EVAP DECAY SLOPE	Evaporative Tank Vacuum Decay Slope
EVAP DUTY(%)	Evaporative Emission Canister, Purge Solenoid Control Duty Cycle
EVAP FLOW	Purge Flow Monitoring Sensor‘
EVAP PRESS SLOPE	Evaporative Tank Vapor Pressure Slope
EVAP PRG FLOW	Purge Flow Monitoring Sensor
EVAP PUR SOL	Evaporative Purge Solenoid
EVAP PURGE SOL	Evaporative Purge Solenoid
EVAP REQ	Canister Purge Requested
EVAP REQUEST	Canister Purge Requested
EVAP SYSTEM	Evaporative System Completed This Driving Cycle
EVAP T VAC	Evaporative Tank Vacuum Decay Slope
EVAP TANK	Evaporative Tank Vacuum Filtered
EVAP VAC SW	Evaporative Vacuum Switch
EVAP VMV	Vmv Output State Monitor
EVAP VNT SOL	Evaporative Canister Vent Solenoid

PID	Extended Description
EVAP VP	Evaporative Vapor Pressure
EVAPPRG OSG	Evaporative System Purge Circuit Open / Short To Ground
EVAPPRG STP	Evaporative System Purge Circuit Short To Volts
EVAPVNT DR H	Evaporative Vent Driver High
EVAPVNT DR L	Evaporative Vent Driver Low
EVAPVNT OSG	Evaporative Vent Circuit Open / Short To Ground
EVAPVNT STP	Evaporative Vent Circuit Short To Volts
EVO ACTUATOR	EGR Variable Orifice Actuator
EVO DUTY	EGR Variable Orifice Duty
EVO DUTY CYCLE	EGR Variable Orifice
EVO FDBACK	EGR Variable Orifice Feedback Voltage
EVO FEEDBACK	EGR Variable Orifice Feedback Voltage
EVO SOL CMD	EGR Variable Orifice Solenoid Command
EVP	EGR Valve Position
EVR	EGR Vacuum Requlator
EVR MONITOR	EGR Vacuum Regulator Output State Monitor
EVR-EGR(%)	EGR Vacuum Regulator %
EXH BCKPRS	Exhaust Back Pressure
EXT IDLE REQ SW	Extended Idle Request Switch
EXHAUST O2	Exhaust Oxygen Status
EXHAUST O2 L	Exhaust Oxygen Status
EXHAUST O2 R	Exhaust Oxygen Status
EXT TRAV BRAKE	Extended Travel Brake
F INJ TMNG+DLY	Fuel Injection Pump Timing With Line Delay
F PRS SEN	Fuel Pressure Sensor
F PSHAFT	Front Prop Shaft Speed
F RAIL PRS	Fuel Rail Pressure
F RAIL TMP	Fuel Rail Temperature
F TEMP SEN	Fuel Temperature Sensor
F.F. PRIORITY	Freeze Frame Priority
FAIL CATMISF	Number Of Failed Catalyst Tests
FAIL CATMISF16	Number Of Failed Catalyst Test Out Of Last 16 Since Code Clear
FAIL CNTR	Fail Counts
FAIL COUNTER	Fail Counts
FAIL EMISMIS16	Number of Feail Emission Misfire Tests Out Of Last 16
FAIL EMISMISCLR	Max # Of Failed Emissions Tests Out Of Last 16 Since Code Clr
FAN CONTROL	Fan Control
FAN DELAY	See FC DELAY
FAN DUTY CYCL	Cooling Fan Relay, Control Signal Duty Cycle
FAN ENABLED	See FC ENABLED
FAN RELAY	See FC RELAY
FAN RELAY 1	Fan Relay 1
FAN RELAY 2	Fan Relay 2
FAN RELAY 2&3	Fan Relay 2&3
FAN REQUEST	See FC REQUESTED
FAN1 EN FREON	See FC1 EN FREON
FAN1 EN OIL	See FC1 EN OIL
FAN1 RELAY	See FC1 RELAY
FAN1 REQUSTD	See FC1 REQUESTED
FAN2 RELAY	See FC2 RELAY
FAN2 REQUSTD	See FC2 REQUESTED
FAST IDLE SET	Fast Idle Setting
FAULT 1 KEY-ON	Fault Key-on Information
FAULT 2 KEY-ON	Fault Key-on Information

PID	Extended Description
FAULT 3 KEY-ON	Fault Key-on Information
FAULT1 KEY-ON	Fault Key-on Information
FAULT2 KEY-ON	Fault Key-on Information
FAULT3 KEY-ON	Fault Key-on Information
FC DELAY	Fan Delay
FC ENABLED	Cooling Fan Enabled
FC RELAY	Cooling Fan Relay Control
FC REQUESTED	Cooling Fan Operation Requested
FC1 EN FREON	Fan #1 Enabled From High A/C Refrigerant Pressure Signal
FC1 EN OIL	Fan #1 Enabled From High Oil Temperature Signal
FC1 RELAY	Cooling Fan Relay Control
FC1 REQUESTED	Cooling Fan Operation Requested
FC1 RLY COM	Fan Control 1 Relay Command
FC1 RLY OSG	Fan Control 1 Relay Circuit Open/Short To Ground
FC1 RLY STP	Fan Control 1 Relay Circuit Short To Volts
FC2 RELAY	Cooling Fan Relay Control
FC2 REQUESTED	Cooling Fan Operation Requested
FC2 RLY OSG	Fan Control 2 Relay Circuit Open/Short To Ground
FC2 RLY STP	Fan Control 2 Relay Circuit Short To Volts
FDBCK 1/1	Feedback Factor 1/1
FDBK FAC1/1	Feedback Factor 1/1
FEATURE	Feature Byte
FIRST FAIL	Mileage Since First Failure
FL COMP S OT	Fuel Compensation Sensor On Time
FL COMP SEN	Fuel Compensation Sensor
FL LVL P	Fuel Level (PZM TO PCM)
FL PMP RLY	Fuel Pump Relay
FL TM INDEX	Fuel Trim Index
FL TNK PRS	Fuel Tank Pressure A/D
FL TNK VPS	Fuel Tank Vapor Pressure Slope
FL TRIM CELL	Fuel Trim Cell
FL TRIM(BLM)CELL	Fuel Trim Cell
FL TRM LEARN	Fuel Trim Learn
FL TRM UPDT	Fuel Trim Update
FLEX FUEL (V)	Flexible Fuel Vehicle Fuel Sensor
FLTNKPRS	Fuel Tank Pressure Voltage
FP FEEDBACK	Fuel Pump Voltage Feedback A/D
FPM/FUEL PUMP	FPM / Fuel Pump
FRACT SPK DELAY	Fractional Spark Delay
FRC MTR ACT	Force Motor Actual Current
FRC MTR COM	Force Motor Commanded Current
FRC MTR DC	Force Motor Duty Cycle
FRCM CR ER	Force Motor Current Error
FRCMTR ACT	Force Motor Actual Current
FRCMTR COM	Force Motor Commanded Current
FRON AXLE REQ	Front Axle Request
FRONT AXLE SW	Front Axle Switch
FRONT O2S	Front Oxygen Sensor Volts
FRP	Fuel Rail Pressure
FRZ FRM DTC	DTC That Set Freeze Frame
FRZ FRM FC	Freeze Frame Fail Counter
FRZ FRM NR	Freeze Frame Not Run Counter
FRZ FRM PC	Freeze Frame Pass Counter
FS/LR CLUTCH	Fail Safe / Low / Reverse - Reverse Clutch

PID	Extended Description
FS/LR SOL	Fail Safe / Low / Reverse Solenoid
FUEL/LEAN MON	Fuel / Lean Monitor
FUEL/RICH MON	Fuel / Rich Monitor
FUEL CELL ID	Fuel Cell ID
FUEL CNTRLSTAT	Fuel Control Status
FUEL CUTOFF	Fuel Cutoff
FUEL FLO SIG	Fuel Flow Signal
FUEL FLOW SIG	Fuel Flow Signal
FUEL INJ 1	Fuel Injector #1
FUEL INJ 2	Fuel Injector #2
FUEL INJ 3	Fuel Injector #3
FUEL INJ 4	Fuel Injector #4
FUEL INJ 5	Fuel Injector #5
FUEL INJ 6	Fuel Injector #6
FUEL INJ 7	Fuel Injector #7
FUEL INJ 8	Fuel Injector #8
FUEL INJ 9	Fuel Injector #9
FUEL INJ 10	Fuel Injector #10
FUEL INJ (S) 1	Fuel Injector #1
FUEL INJ (S) 2	Fuel Injector #2
FUEL INJ (S) 3	Fuel Injector #3
FUEL INJ (S) 4	Fuel Injector #4
FUEL INJ (S) 5	Fuel Injector #5
FUEL INJ (S) 6	Fuel Injector #6
FUEL INJ (S) 7	Fuel Injector #7
FUEL INJ (S) 8	Fuel Injector #8
FUEL INJ (S) 9	Fuel Injector #9
FUEL INJ (S) 10	Fuel Injector #10
FUEL LEVEL	Fuel Level Sensor
FUEL LVL	Fuel Level
FUEL MON SIG	Fuel Monitor Signal
FUEL MONITOR	Fuel Monitor Completed This Driving Cycle
FUEL PMP SPD	Fuel Pump Speed
FUEL PRES (PSIG)/(KPA)	Fuel System Pressure
FUEL PUMP	Fuel Pump
FUEL PUMP REL	Fuel Pump Relay
FUEL PUMP RLY	Fuel Pump Relay Control
FUEL PUMP(V)	Fuel Pump Supply Voltage
FUEL PW1(MS)	Fuel Injector Pulse Width Control
FUEL PW2(MS)	Fuel Injector Pulse Width Control
FUEL PW B1	Fuel Injector Pulse Width (Left)
FUEL PW B2	Fuel Injector Pulse Width (Right)
FUEL RAIL PRS	Fuel Rail Pressure
FUEL RATE	Fuel Rate
FUEL SHUTSTAT	Fuel Shutoff Valve Status
FUEL STATUS 1	Fuel System 1 Loop Status
FUEL STATUS 2	Fuel System 2 Loop Status
FUEL SYS	Rich/lean Fuel System States
FUEL SYS 1	Fuel System 1 Loop Status
FUEL SYS 2	Fuel System 2 Loop Status
FUEL SYS BK1	Rich/lean Bank 1
FUEL SYS BK2	Rich/lean Bank 2
FUEL SYS TEST	Fuel System Test
FUEL SYS TST	Fuel System Test

PID	Extended Description
FUEL SYS1	Fuel System 1 Loop Status
FUEL SYS2	Fuel System 2 Loop Status
FUEL SYSTEM 1	Fuel System Bank 1 Loop Status
FUEL SYSTEM 2	Fuel System Bank 2 Loop Status
FUEL TANK PRESS	Fuel Tank Pressure With Bias
FUEL TEMP	Fuel Temperature
FUEL TMG REL	Fuel Timing Relay
FUEL TMG SOL	Fuel Timing Solenoid
FUEL TMNG SOL	Fuel Timing Solenoid
FUEL VOLDES	Volume Fuel Desired
FUELPW1	Fuel Injector Pulsewidth, Bank 1
FUELPW2	Fuel Injector Pulsewidth, Bank 2
GAR SFT APT	Garage Shift Adapt
GAS FUEL R	Gasoline Fuel Run Time Log
GAS MASS	Gass Mass Sensor
GEAR BOX R	Transmission Gear Ratio
GEAR BOX R	Gear Box Ratio
GEAR BOX T	Gear Box Torque
GEAR CMDED	Commanded Gear For Transmission
GEAR COMMD	Commanded Generator
GEAR CURRENT	Current Gear
GEAR RATIO	Current Transmission Calculated Gear Ratio
GEAR/TCC	Transmission Shift Schedule 41TE / 42LE / 45RFE
GEN CMDED	Commanded Generator
GEN FIELD	Generator Field
GEN L TERM	Generator L Terminal
GEN PWM	Generator PWM
GENERATOR LMP	Generator Lamp
GLOW PLUG	Glow Plug Voltage
GLOW PLUG HTR	Glow Plug Heater Relay
GLOWPLGLMP	Glow Plug Lamp On Time
GLOWPLUGB1	Glow Plug Current Bank 1
GLOWPLUGB2	Glow Plug Current Bank 2
GOV PRES SOL	Governor Pressure Solenoid
GOV PRES-A	Actual Governor Pressure
GOV PRES-T	Theoretical Governor Pressure
GOVPRESACT	Actual Governor Pressure
GOVPRES SOL	Governor Pressure Solenoid
GOVPRESTHE	Theoretical Governor Prssure
GP REL FB	Glow Plug Relay Feedback
GPLUG HTR REL	Glow Plug Heater Relay
H2O IN FUEL LMP	Water In Fuel Lamp
H2O IN FUEL	Water In Fuel
HANDWHEEL POS	Handwheel Position
HEATD W/S REQ	Heated Windshield Request Switch
HEATD WNDSHLD	Heated Windshield Relay Control
HFC	High Speed Fan Control
HF RELAY	Radiator Fan High Relay
HI ALTITUDE	High Altitude Switch
HI ELEC LOAD	High Electrical Load
HI MAP RATE	Hight MAP RAT Fail Count
HI RES SIG	High Resolution Signal
HI SPD FAN #2	High Speed Radiator Fan #2
HI SPD FAN #3	High Speed Radiator Fan #3

PID	Extended Description
HI SPK MODE	High Spark Modifier
HICELL DLT	High Cell Delta Pressure
HIGH BATTERY	High Battery
HI-RPM FAN EN	Fan Enabled For High RPM Conditions
HO2S	Heated Oxygen Sensor 2
HO2S1-1AV BI	Heated Oxygen Bank 1 Sensor 1 Average Bias Voltage
HO2S1-3AV BI	Heated Oxygen Bank 1 Sensor 3 Average Bias Voltage
HO2S2-1AV BI	Heated Oxygen Bank 2 Sensor 1 Average Bias Voltage
HO2S 1	Heated Oxygen Sensor 1
HO2S 1-1	Heated Oxygen Sensor Bank 1 Sensor 1
HO2S 1-2	Heated Oxygen Sensor Bank 1 Sensor 2
HO2S 1-3	Heated Oxygen Sensor Bank 1 Sensor 3
HO2S 1-A	Heated Oxygen Sensor Bank 1 Sensor A
HO2S 2	Heated Oxygen Sensor 2
HO2S 2-1	Heated Oxygen Sensor Bank 2 Sensor 1
HO2S 2-2	Heated Oxygen Sensor Bank 2 Sensor 2
HO2S CNT B1	Bank 1 HO2s Crossover Counts
HO2S CNT B2	Bank 2 HO2s Crossover Counts
HO2S MONITOR	HO2s Monitor Completed This Driving Cycle
HO2S HEATER CMD	Heated Oxygen Heater Command
HO2S POST	Heated Oxygen Post
HO2S PRE	Pre Heated Oxygen
HO2S VAR B1S1	Heated Oxygen Varience Bank 1 Sensor 1
HO2S VAR B2S1	Heated Oxygen Varience Bank 2 Sensor 1
HOT LAMP	Hot Lamp
HOT MODE	Hot Mode
HOT OPN LP	Hot Open Loop
HSPD FAN REL	High Speed Radiator Fan Relay
HSPD2 FAN REL	High Speed Radiator Fan Relay 2
HSPD3 FAN REL	High Speed Radiator Fan Relay 3
IAC	Idle Air Control Duty Cycle
IAC SHUT 1STP	Idle Air Control Shut 1 Step
IAC DIRECTION	Idle Air Control Actuator Direction
IAC MOTOR	Idle Air Control Motor
IAC MTR CLOSE1	Idle Air Control Motor Shut 1 Step
IAC MTR OPEN1	Idle Air Control Motor Open 1 Step
IAC MTR POS	Idle Air Control Motor Position
IAC OPEN 1STP	Idle Air Control Motor Open 1 Step
IAC POS DESIRED	Idle Air Control Desired Motor Position
IAC POS REQ	Idle Air Control Actuator Position Required
IAC POS W AC	Idle Air Control Motor Positon With Air Conditioning
IAC POS WO AC	Idle Air Control Motor Positon With Out Air Conditioning
IAC POSITION	Idle Air Control Actuator Position
IAC TRM	Idle Air Control Airflow Trim 2
IAC TRM0	Idle Air Control Airflow Trim 0
IAC TRM1	Idle Air Control Airflow Trim 1
IAC TRM3	Idle Air Control Airflow Trim 3
IAT	Inlet Air Temperature
IAT (V)	Intake Air Temperature
IAT A/D	Intake Air Temperature Analog To Digital Reading
IAT AT START	Start Up Intake Air Temperature
IAT AT STRT	Start Up Intake Air Temperature
IAT RAW	Raw Inlet Air Temperature
IAT SENSOR	Inlet Air Temperature Sensor

PID	Extended Description
IAT TEMP (°F)/(°C)	Intake Air Temperature
IAT TEMP (C)/(F)	Inlet Air Temperature
IAT UNDEF	Undefaulted Intake Air Temperature
IC BYPASS	Ignition Control Bypass
IC ENABLED	Ignition Control Enabled
IDL DIA ERR	Idle Diagnostic Filtered RPM Error
IDLE	IDLE
IDLE REQ(RPM)	Idle RPM Requested
IDLE RPM	Engine Idle Speed
IDLE RPM DES	Idle Speed Desired
IDLE SWITCH	Idle Switch
ING 0	Ignition 0 Voltage
IGN 0 ECM	Ignition 0 Voltage To ECM Side
IGN 1	Ignition 1 Voltage
IGN 3	Ignition 3 Voltage
IGN ADV	Ignition Advance
IGN ADV CYL1	Ignition Timing Advance # 1 Cylinder
IGN BYPASS	Ignition Bypass
IGN CYC CNT	Ignition Cycle Counter
IGN COIL	Ignition Coil
IGN COIL 1	Ignition Coil #1
IGN COIL 2	Ignition Coil #2
IGN COIL 3	Ignition Coil #3
IGN COIL 4	Ignition Coil #4
IGN COIL 5	Ignition Coil #5
IGN COIL 6	Ignition Coil #6
IGN COIL 7	Ignition Coil #7
IGN COIL 8	Ignition Coil #8
IGN COIL 9	Ignition Coil #9
IGN COIL 10	Ignition Coil #10
IGN EBTCM	Ignition Electronic Body Traction Control Module
IGN OFF	Ignition OFF
IGN SENSE	Ignition Sense
IGN SNC 12V L	Ignition Cycles Since 12 Volt Low
IGNADV CYL1	Ignition Timing Advance Cylinder 1
IGNITION	Ignition Voltage
IGNITION MDE	Ignition Mode
IGNITION SW	Ignition Switch
ILC SOLENOID	Idle Load Compensator Solenoid
IND TP ANG	Throttle Position Indicated Angle
INGEAR TRIP	In Gear Trip Flag
INJ 1 FAULT	Injector 1 Fault
INJ 2 FAULT	Injector 2 Fault
INJ 3 FAULT	Injector 3 Fault
INJ 4 FAULT	Injector 4 Fault
INJ 5 FAULT	Injector 5 Fault
INJ 6 FAULT	Injector 6 Fault
INJ 7 FAULT	Injector 7 Fault
INJ 8 FAULT	Injector 8 Fault
INJ 9 FAULT	Injector 9 Fault
INJ 10 FAULT	Injector 10 Fault
INJ A PW(MS)	Fuel Injector Pulse Width Control - TBI
INJ B PW(MS)	Fuel Injector Pulse Width Control - TBI
INJ CNTRLPRES	Injector Control Pressure

PID	Extended Description
INJ FAULT	Injector Fault
INJ L PW(MS)	Fuel Injector Pulse Width Control - MPFI
INJ PULSE	Injector Pulse Width
INJ PULSE 1	Injector Pulse Width Cylinder 1
INJ PULSE 2	Injector Pulse Width Cylinder 2
INJ PULSE 3	Injector Pulse Width Cylinder 3
INJ PULSE 4	Injector Pulse Width Cylinder 4
INJ PW LB	Injection Pulse With Left Bank
INJ PW(MS)	Fuel Injector Pulse Width Control
INJ PWM B 1	Injector PWM Bank 1
INJ PWN B 2	Injector PWM Bank 2
INJ PWRB	Injection Pulse Width Rigth Bank
INJ R PW(MS)	Fuel Injector Pulse Width Control - MPFI
INJ TEMP	Fuel Injector Temperature
INJ TMEP SEN	Fuel Injector Temperature Sensor
INJ1 (mS)	Injector Pulse Width
INJ1 PW	Injector 1 Pulse Width
INJ1 BPW	Injector Base Pulse Width Module Cylinder 1
INJ2 (mS)	Injector Pulse Width
INJ2 PW	Injector 2 Pulse Width
INJ2 BPW	Injector Base Pulse Width Module Cylinder 2
INJ3 BPW	Injector Base Pulse Width Module Cylinder 3
INJ4 BPW	Injector Base Pulse Width Module Cylinder 4
INJEC PUMP ANGLE	Fuel Injection Pump Injection Angle Diesel
INJPMP SOL	Diesel Fuel Injection Pump Solenoid Closure Time
INT MAN CTL1	Intake Manifold Runner Control Position Bank 1
INT MAN CTL2	Intake Manifold Runner Control Position Bank 2
INT MANIF CNTRL	Intake Manifold Communication Control
INTAKE HTR 1	Intake Heater 1
INTAKE HTR 2	Intake Heater 2
INTAKE SW SOL	Intake Switch Solenoid
INTEGRATOR	See ST FUEL TRIM
INTEGRATOR L	See ST FUEL TRIM L
INTEGRATOR R	See ST FUEL TRIM R
IGT HTR 1	Intake Heater #1
IGT HTR 2	Intake Heater #2
IPC FUEL DIS	Injection Pump Can Fuel Disabled
IPMP REF MIS	Injection Pump Cam Ref Missed
ISC DIRECTION	Idle Speed Control Direction
ISC MOTOR	Idle Speed Control Motor
ISC NOSE SW	Idle Speed Control Nose Switch
J2	J2
KEYON 2ND LAST	Key ON's Since 2nd Most Recent Fault
KEYON 3RD LAST	Key ON's Since 3rd Most Recent Fault
KEYON SNC LAST	Key ON's Since Most Recent Fault
KICKDOWN ENAB	Kickdown Enabled
KNK RET CYL1	Cylinder 1 Knock Retard
KNK RET CYL2	Cylinder 2 Knock Retard
KNK RET CYL3	Cylinder 3 Knock Retard
KNK RET CYL4	Cylinder 4 Knock Retard
KNK RET TOT	Overall Knock Retard
KNOCK CNTER	Knock Sensor Counter
KNOCK COUNTER	Knock Sensor Counter
KNOCK OA(°)	Overall Knock Retard

PID	Extended Description
KNOCK RET	Knock Retard
KNOCK RET1 (°)	Cylinder Knock Retard
KNOCK RET2 (°)	Cylinder Knock Retard
KNOCK RET3 (°)	Cylinder Knock Retard
KNOCK RET4 (°)	Cylinder Knock Retard
KNOCK RETARD	Knock Retard
KNOCK RTRD	Knock Retard
KNOCK SEN (V)	Knock Sensor Signal
KNOCK SEN1 (V)	Knock Sensor Signal
KNOCK SEN2 (V)	Knock Sensor Signal
KNOCK SENS	Knock Sensor
KNOCK SENSOR	Knock Sensor
KS 2LONG	Knock Too Long
KS1	Knock Sensor # 1
KS2	Knock Sensor # 2
KS ACTIVE	Knock Sensor Active Counter
KS ACTIVITY	Knock Signal Present
KS ADJUST	Knock Signal Adjustment Factor
KS IDL NSE	Knock Sensor Idle Noise
KS NOISE	Knock Sensor Noise
KS NOISE CHNL	Knock Sensor Noise Channel
KSB MTR CKT	Knock Sensor Board Motor Circuit
KS COUNTER	Knock Sensor Counter
KS FAILURE	Knock Sensor Failure
L FL TM ACC	Long Term Fuel Trim Accel
L FL TM AV1	Long Term Fuel Trim Average Bank 1
L FL TM AV2	Long Term Fuel Trim Average Bank 2
L FL TM CRS	Long Term Fuel Trim Cruise
L FL TM DEC	Long Term Fuel Trim Decal
L FL TM IDL	Long Term Fuel Trim Idle
L PRES A/D	Line Pressure A/D Input
L PRES DC	Line Pressure Duty Cycle
L PRES SW	Line Pressure Switch
L OCT SPK M	Low Octane Spark Modifier
L/R AVG TIME	Lean To Rich Average Time
L/R TRANS	Lean To Rich Transitions
LAST FAIL	Mileage Since Last Failure
LAST FAULT(V)	Last Fault
LAST SHIFT	Time of Latest Shift
LATEST CODE	ID Of Most Recent Stored Fault
LDP SYSTEM	Leak Detection Pump System Test
LFC	Low Speed Fan Control
LF COMMAND	Left Front Command
LF RELAY	Low Speed Fan Relay
LF SENSED	Left Front Sensed
LF SOL STATUS	Left Front Solinoid Status
LF WHEEL SPD	Left Front Wheel Speed
LF WHL STATUS	Left Front Wheel Status
LIFT PUMP	Lift Pump Voltage
LINE PRES	Line Pressure
LK DETCT PUMP	Leak Detection Pump
LK DETCT PMP	Leak Detection Pump Solenoid
LK DETCT PMP SW	Leak Detection Pump Switch
LK DETCT PMP SYS	Leak Detection Pump System Test

PID	Extended Description
LO COOLANT LMP	Low Coolant Lamp
LO FAN RELAY	Radiator Low Fan Relay
LO RES REF	Low Resolution Reference Pulses
LO SPK MOD	Low Spark Modifier
LOAD AT MISF	Engine Load At Misfire
LOOP STATUS	Loop Status
LOSS OF MATCH	Loss Of Match Counter
LOW COOLANT	Low Coolant Warning
LOW OIL	Low Oil Indicator
LOW OIL LMP	Low Oil Lamp
LR CL VOL IND	Low/Reverse Clutch Volume Index
LR PRESS SW	Low/Reverse Pressure Switch
LR SOL	Low/Reverse Solenoid
LR TCS SOL	Left Rear Traction Control System Solenoid
LR TCS STATUS	Left Rear Traction Control System Status
LR WHEEL SPD	Left Rear Wheel Speed
LRCC CLUTCH ST	Low/Reverse Clutch Control - Clutch State
LRCC PRES SW	Low/Reverse Clutch Control Pressure Switch
LRCC SOL	Low/Reverse Clutch Control Solenoid
L/R-LU CLUTCH	Low / Reverse - Low Clutch or Lock-Up Clutch
LRCC CL VOL IND	Low/Reverse Clutch Control Clutch Volume Index
LRND FVOL-4C	Learned Fill Volume - -4C Clutch
LRND IAC W	Learned IAC With Air Conditioning
LRND IAC WO	Learned IAC With Out Air Conditioning
LSPD FAN REL	Latest State Fan Relay Pending
LST 1-2 SFT	Time of Latest 1-2 Shift
LST 2-3 SFT	Time of Latest 2-3 Shift
LST 3-4 SFT	Time of Latest 3-4 Shift
LST GEAR SHFT	Latest Shift Code
LST SFT ERR	Last Shift Time Error
LSTCODE/CL	Odometer When Last Code Set Since Cleared
LT CORREC CELL	Long Term Correction Cell
LT FT ACCL LRN	Long Term Fuel Trim Acceleration Learned
LT FT B1	Bank 1 Long Term Air To Fuel Ratio Correction Factor
LT FT B2	Bank 2 Long Term Air To Fuel Ratio Correction Factor
LT FT CRZ LRN	Long Term Fuel Trim Cruise Learned
LT FT DCL LRN	Long Term Fuel Trim Decel Learn
LT FT IDL LRN	Long Term Fuel Trim Idle Learn
LT FTRM AV1	Long Term Fuel Trim Average Bank 1
LT FTRM AV2	Long Term Fuel Trim Average Bank 2
LT FTRM1	Bank 1 Long Term Air To Fuel Ratio Correction Factor
LT FTRM2	Bank 2 Long Term Air To Fuel Ratio Correction Factor
L TCS COMMAND	Left Traction Control System Command
L TCS SENSED	Left Traction Control System Sensed
LT FL TRM 1	Long Term Fuel Trim Bank 1
LT FL TRM 2	Long Term Fuel Trim Bank 2
LT FL TRM AV1	Long Term Fuel Trim Average Bank 1
LT FL TRM AV2	Long Term Fuel Trim Average Bank 2
LT FUEL TR CL (Block Learn Cell)	Long-term Fuel Trim Cell
LT FUEL TR EN (BLM ENABLED)	Long-term Fuel Trim Enabled
LT FUEL TRIM	Long Term Fuel Trim
LT FUEL TRM L	Long Term Fuel Trim Left Bank
LT FUEL TRM R	Long Term Fuel Trim Right Bank
LTST DTC INT	Latest Fault Code Intermittent

PID	Extended Description
LTST DTC PEND	Latest Diagnostic Trouble Code Is Pending Diagnostic Trouble Code
LTST TRAN DTC	Latest Transmission Diagnostic Trouble Code Stored
M SNCDTCCL	Mileage Since Diagnostic Trouble Codes Cleared
M/T CLUTCH DIS	Manual Transmission Clutch Disengaged
MAF	Mass Air Flow Sensor
MAF BURNOFF	Mass Air Flow Burnoff
MAF FREQ	Mass Air Flow Sensor Frequency
MAF IDLE FUL EGR	MAF Idle Diagnosis Full EGR
MAF IDLE NO EGR	MAF Idle Diagnosis No EGR
MAF RAW INP	Mass Air Flow Raw Input Frequency
MAF SEN 1	Mass Air Flow Sensor 1
MAF(GM/SEC)/(LB/M)	Mass Air Flow lb/m or gm/sec
MAF/EGR FLOW	Desired MAF/EGR Flow
MAF/EGR FLOW DES	Desired MAF/EGR Flow
MALF HISTORY	Malfunction History Display
MANFLD TUNING	Manifold Tuning
MANIFGAUGE	Manifold Gauge Pressure
MAP	Manifold Absolute Pressure
MAP A/D LRN	Manifold Pressure Sensor Analog To Digital Reading Learned Value
MAP DIFRNTIAL	Manifold Absolute Pressure Differential
MAP GAU	Manifold Absolute Pressure Gauge
MAP GAUGE ("HG)	Manifold Absolute Pressure Gauge Reading
MAP PASSES/FAILED	Manifold Absolute Pressure Sensor Test Pass/fail
MAP TCM	Manifold Absolute Pressure MAP-TCM
MAP TURBO	Manifold Absolute Presssure Turbo
MASFUELDES	Mass Fuel Desired
MAT (°C)/(°F)	See IAT
MC DUTY CYC	Mixture Control Solenoid Duty Cycle
MC DWL(°)	Mixture Control Solenoid Dwell
MEA INJ TIM	Measured Diesel Fuel Injection Pump Timing
MED RES ENG	Medium Resolution Engine Speed Activity
MED RES REF	Medium Resolution Reference Pulses
MED RE-SYNC	Medium Resolution Re-syncs Counter
METHANOL (%)	Methanol Fuel Content
MF F SNC 1F	Total Misfire Failures Since First Fail
MF P SNC 1F	Total Misfire Passes Since First Fail
MID SPK MOD	Mid. Spark Modifier
MIL (CHK ENG LIGHT)	Malfunction Indicator Lamp
MIL DIST	Distance Since Malfunction Indicator Lamp Came On
MIL DRVR H	Malfunction Indicator Lamp Driver High
MIL DRVR L	Malfunction Indicator Lamp Driver Low
MIL STATUS	MIL Light Status
MIL TIM	Minutes Run By Malfunction Indicator Lamp Since Activated
MIL WAS ON	Malfunction Indicator Lamp Was ON
MIL WAS ON/DTC	Malfunction Indicator Lamp Was ON For This Fault
MIN AIRFLW	Minimum Airflow
MIN AIS	Minimum Automated Idle Speed Position
MIN IAT	Minimum Intake Air Temperature
MIN THROT (V)	Minimum Throttle Position Sensor - PCM Value
MIS CUR 1	Misfire Current Cyl #1
MIS CUR 2	Misfire Current Cyl #2
MIS CUR 3	Misfire Current Cyl #3
MIS CUR 4	Misfire Current Cyl #4
MIS CUR 5	Misfire Current Cyl #5

PID	Extended Description
MIS CUR 6	Misfire Current Cyl #6
MIS CUR 7	Misfire Current Cyl #7
MIS CUR 8	Misfire Current Cyl #8
MIS CYL P	Misfire Cylinder Primary
MIS CYL S	Misfire Cylinder Secondary
MIS CYL STAT	Misfire Per Cylinder Status
MIS EGRDPFE	EGR Delta Pressure Feedback Sensor Input At Time of Misfire
MIS HIST 1	Misfire History Cyl #1
MIS HIST 2	Misfire History Cyl #2
MIS HIST 3	Misfire History Cyl #3
MIS HIST 4	Misfire History Cyl #4
MIS HIST 5	Misfire History Cyl #5
MIS HIST 6	Misfire History Cyl #6
MIS HIST 7	Misfire History Cyl #7
MIS HIST 8	Misfire History Cyl #8
MIS HIST 9	Misfire History Cyl #9
MIS HIST 10	Misfire History Cyl #10
MIS PER TEST	Total Misfires Per Test Special
MISF DELAY	Misfire Display
MISF DIS	Transmission Power Relay
MISF EGR DPFE	EGR DPFE Sensor Input at the Time of Misfire
MIS ENBLD	Misfire Detection Enabled
MISF ENGLOAD	Engine Load at the Time of Misfire
MISF ENG LOAD	Engine Load at the Time of Misfire
MISF IAT	Intake Air Temperature at the Time of Misfire
MISF MON	Misfire Monitor
MISF PNP	In Drive During the Time of Misfire
MISF SOAK	Engine-off Soak Time at the Time of Misfire
MISF TIME	Engine Running Time At Time of Misfire
MISF TPS	Throttle Position at the Time of Misfire
MISF TRIPS SNC	Number Of Trips Since The Time Of Misfire
MISF VSS	Vehicle Speed at the Time of Misfire
MISF WHL ACCL	Misfire Wheel Acceleration
MISF WHL PROFL	Misfire Wheel Profile Learned In Kam
MISFIR CYL	Misfiring Cylinder
MISFIRE AT	Engine Speed at Misfire
MISFIRE DETEC	Currently Misfiring
MISFIRE MON	Misfire Monitor Completed This Driving Cycle
MIX CTRL S	Mixture Control Solenoid Command
MLP	Manual Lever Position
MOD SPK ADV	Module Spark Advance
MODE SW S	Mode Switch Selected
MPG REQST SW	Miles Per Gallon Request Switch
MPG RESET SW	Miles Per Gallon Reset Switch
MTV SOLENOID	Manifold Tuning Valve Solenoid
MU FUEL MDE	Make-Up Fueling Mode
NEWEST FLT	Newest Fault
NONDR WHEEL	Non-driven Wheel Speed
NONVOLAT MEM	Non Volatile Memory
NOSE SWITCH	Nose Switch
NOT RUN CNT	Not Run Counter
NOT RUN COUNT	Not Run Counter
O2 #TRNS 1-1	Oxygen # of Rich/lean To Lean/rich Transitions Bank 1 Sensor 1
O2 1/1 STATE	Oxygen Sensor State

PID	Extended Description
O2 1/1 STATE (V)	Oxygen Sensor Signal
O2 1/2 STATE	Oxygen Sensor State
O2 1/2 STATE (V)	Oxygen Sensor Signal
O2 1/3 STATE	Oxygen Sensor State
O2 1/3 STATE (V)	Oxygen Sensor Signal
O2 2/1 STATE	Oxygen Sensor State
O2 2/1 STATE (V)	Oxygen Sensor Signal
O2 2/2 STATE	Oxygen Sensor State
O2 2/2 STATE (V)	Oxygen Sensor Signal
O2 AVG BIAS	Oxygen Average Bias Voltage
O2 BNK1 #1	Oxygen Sensor Bank 1 Sensor 1
O2 HEATER TEST	Oxygen Heater Test
O2 HTR 1	Oxygen Heater Time To Activity Sensor 1
O2 HTR 1-1	Oxygen Heater Time To Activity Bank 1 Sensor 1
O2 HTR 1-2	Oxygen Heater Time To Activity Bank 1 Sensor 2
O2 HTR 1-3	Oxygen Heater Time To Activity Bank 1 Sensor 3
O2 HTR 2	Oxygen Heater Time To Activity Sensor 2
O2 HTR 2-1	Oxygen Heater Time To Activity Bank 2 Sensor 1
O2 HTR 2-2	Oxygen Heater Time To Activity Bank 2 Sensor 2
O2 HTR 2-3	Oxygen Heater Time To Activity Bank 2 Sensor 3
O2 HTR CUR	Oxygen Heater Current
O2 HTR DUTY CYC	Oxygen Heater Duty Cycle
O2 HTR DWNSTRM	Downstream Oxygen Heater
O2 HTR RELAY	Oxygen Heater Relay
O2 HTR UPSTRM	Upstream Oxygen Heater
O2 LN-RH 1-1	Oxygen Response Lean To Rich Switches Bank 1 Sensor 1
O2 LN-RH 1-2	Oxygen Response Lean To Rich Transition Time Bank 1 Sensor 2
O2 LN-RH 2-1	Oxygen Response Lean To Rich Transition Time Bank 2 Sensor 1
O2 LN-RH AV	Oxygen Lean/rich Average Time
O2 LN-RH TNS	Oxygen Lean/rich Transitions
O2 L-R SW 1-2	Oxygen Response Lean To Rich Switches Bank 1 Sensor 2
O2 L-R SW 2-1	Oxygen Response Lean To Rich Switches Bank 2 Sensor 1
O2 RH-LN 1-1	Oxygen Response Rich To Lean Transition Times Bank 1 Sensor 1
O2 RH-LN 1-2	Oxygen Response Rich To Lean Transition Time Bank 1 Sensor 2
O2 RH-LN 2-1	Oxygen Response Rich To Lean Transition Time Bank 2 Sensor 1
O2 RH-LN AV	Oxygen Rich/lean Average Time
O2 RH-LN TNS	Oxygen Rich/lean Transitions
O2 R-L SW1-1	Oxygen Response Rich To Lean Switches Bank 1 Sensor 1
O2 R-L SW2-1	Oxygen Response Rich To Lean Switches Bank 2 Sensor 1
O2 RSP R-L 1-1	Oxygen Response Rich To Lean Switches Bank 1 Sensor 1
O2 SEN 1	Oxygen Sensor 1 Volts
O2 SEN 1/1	Oxygen Sensor 1/1
O2 SEN 1/2	Oxygen Sensor 1/2
O2 SEN 1/3	Oxygen Sensor 1/3
O2 SEN 2	Oxygen Sensor 2 Volts
O2 SEN 2/1	Oxygen Sensor 2/1
O2 SEN 2/2	Oxygen Sensor 2/2
O2 SENSOR	Oxygen Sensor
O2 SEN STATE	Oxygen Sensor State
O2 SEN STATE (V)	Oxygen Sensor Signal
O2 SEN STATE1	Oxygen Sensor State
O2 SEN STATE1 (V)	Oxygen Sensor Signal
O2 SEN STATE2	Oxygen Sensor State
O2 SEN STATE2 (V)	Oxygen Sensor Signal

PID	Extended Description
O2 SENSOR(V)	Oxygen Sensor
O2 SENSOR1(V)	Oxygen Sensor 1
O2 SENSOR2(V)	Oxygen Sensor 2
O2 SENSOR BIAS	Oxygen Sensor Bias
O2 SIGNAL	Oxygen Sensor Signal
O2 STATE AVG	Oxygen Sensor State Average
O2 VOLTS AVG	Oxygen Sensor Voltage Average
O2CROSS B1	Oxygen Crosscounts Bank 1
O2CROSS B2	Oxygen Crosscounts Bank 2
O2CROSS CNT	Oxygen Crossover Counts
O2HTR 1-1 ACT	Actual Heater Status Is ON
O2HTR 1-1 CMD	Heater Commanded ON
O2HTR 1-1 FL CNT	Driver Failure Count
O2HTR 1-1 FLT	Heater Output Driver Fault
O2HTR 1-1	Heater Time to Activity Bank 1 Sensor 1
O2HTR 1-2 ACT	Actual Heater Status Is ON
O2HTR 1-2 CMD	Heater Commanded ON
O2HTR 1-2 FL CNT	Driver Failure Count
O2HTR 1-2 FLT	Heater Output Driver Fault
O2HTR 1-2	Heater Time to Activity Bank 1 Sensor 2
O2HTR 1-3	Heater Time to Activity Bank 1 Sensor 3
O2HTR 2	Heater Time to Activity Sensor 2
O2HTR 2-1 ACT	Actual Heater Status Is ON
O2HTR 2-1 CMD	Heater Commanded ON
O2HTR 2-1 FL CNT	Driver Failure Count
O2HTR 2-1 FLT	Heater Output Driver Fault
O2HTR 2-1	Heater Time to Activity Bank 2 Sensor 1
O2HTR 2-2 ACT	Actual Heater Status Is ON
O2HTR 2-2 CMD	Heater Commanded ON
O2HTR 2-2 FL CNT	Driver Failure Count
O2HTR 2-2 FLT	Heater Output Driver Fault
O2HTR 2-2 HO2S11	Heater Time to Activity Bank 2 Sensor 2
O2HTR 2-3	Heater Time to Activity Bank 2 Sensor 3
O2HTR DR1	Oxygen Sensor Driver 1
O2HTR DR2	Oxygen Sensor Driver 2
O2HTR DR3	Oxygen Sensor Driver 3
O2HTR DR4	Oxygen Sensor Driver 4
O2HTR TEST	Oxygen Sensor Heater Test
O2LN-RH TNS	Lean / Rich Transitions
O2LN-RH1-1	Oxygen Response Lean To Rich Transition Bank 1 Sensor 1
O2LN-RH1-2	Oxygen Response Lean To Rich Transition Bank 1 Sensor 2
O2LN-RH2-1	Oxygen Response Lean To Rich Transition Bank 2 Sensor 1
O2LN-RHAV	Oxygen Response Lean To Rich Average Time
O2L-R SW1-1	Oxygen Response Lean To Rich Switches Bank 1 Sensor 1
O2L-R SW1-2	Oxygen Response Lean To Rich Switches Bank 1 Sensor 2
O2L-R SW2-1	Oxygen Response Lean To Rich Switches Bank 2 Sensor 1
O2R FAIL LEFT	Rear Oxygen Fail Time Left
O2R TIME TO ACTI	Rear Oxygen Time To Activity
O2RH-LN TNS	Oxygen Rich / Lean Transition
O2RH-LN1-1	Oxygen Rich / Lean Transition Times Bank 1 Sensor 1
O2RH-LN1-2	Oxygen Rich / Lean Transition Times Bank 1 Sensor 2
O2RH-LN2-1	Oxygen Rich / Lean Transition Times Bank 2 Sensor 1
O2RH-LNAV	Oxygen Rich / Lean Transition Average Time
O2R-L SW1-1	Oxygen Rich / Lean Switches Bank 1 Sensor 1

PID	Extended Description
O2R-L SW1-2	Oxygen Rich / Lean Switches Bank 1 Sensor 2
O2R-L SW2-1	Oxygen Rich / Lean Switches Bank 2 Sensor 1
O2RSP R-L 1-1	Oxygen Response Rich / Lean Switches Bank 1 Sensor 1
O2S 1 RDY	Oxygen Sensor 1 Ready
O2S 1-1	Oxygen Sensor Bank 1 Sensor 1
O2S 1-1 AV	Oxygen Average Volts Bank 1 Sensor 1
O2S 1-2	Oxygen Sensor Bank 1 Sensor 2
O2S 1-2 AV	Oxygen Average Volts Bank 1 Sensor 2
O2S 1-3	Oxygen Sensor Bank 1 Sensor 3
O2S 1-3 AV	Oxygen Average Volts Bank 1 Sensor 3
O2S 1-4	Oxygen Sensor Bank 1 Sensor 4
O2S 2-1	Oxygen Sensor Bank 2 Sensor 1
O2S 2-1 AV	Oxygen Average Volts Bank 2 Sensor 1
O2S 2-2	Oxygen Sensor Bank 2 Sensor 2
O2S 2-3	Oxygen Sensor Bank 2 Sensor 3
O2S 2-4	Oxygen Sensor Bank 2 Sensor 4
O2S BIAS	Oxygen Sensor Bias
O2S CROSSCNTS	Oxygen Sensor Crosscounts
O2S CRSCNTS L	Oxygen Sensor Crosscounts Left Bank
O2S CRSCNTS R	Oxygen Sensor Crosscounts Right Bank
O2S LEFT(MV)	Oxygen Sensor Left Bank
O2S LOCA	Oxygen Sensor Location
O2S RIGHT(MV)	Oxygen Sensor Right Bank
O2S1-1 HTR RLY	Pulse Width Modulated Oxygen Sensor Heater 1/1 Relay
O2S2-1 HTR RLY	Pulse Width Modulated Oxygen Sensor Heater 2/1 Relay
O2S	Oxygen Sensor
O2S(MV)	Oxygen Sensor
O2S MON	Oxygen Sensor Monitor
O2SEN 1	Oxygen Sensor 1 Volts
O2SEN 2	Oxygen Sensor 2 Volts
OBD2 FLAG2	On Board Diagnostics Flag 2
OBD CYCL CNT	Number of Completed OBD II Drive Cycles
OBD TRIP CNT	Number of Completed OBD II Trips
OBD2 STAT	OBD II System Type
OBD2 STATUS	OBD II System Status
OBD-II TRIP	OBD II Drive Trip Completed
OCS-TRANS SW	Oxygen Control Sensor Transmission Switch
OCT FUEL MOD	Low Octane Fuel Spark Modifier
OCTADJ	Octane Adjust
OCT LEVEL CUR	Current Octane Level
OCTANE LEVEL CUR	Current Octane Level
OD CANCEL	Overdrive Cancel Switch
OD CLUTCH	Overdrive Clutch
OD CLUTCH ST	Overdrive Clutch State
OD CL VOL IND	Overdrive Clutch Volume Index
OD LOCKOUT SW	Overdrive Lockout Switch
OD OVERRIDE LMP	Overdrive Override Lamp
OD PRESS SW	Overdrive Pressure Switch
OD REQUEST-MT	Overdrive Request-manual Transmission
OD SOL	Overdrive Solenoid
OD SOLENOID	Overdrive Solenoid
OD SWITCH-AT	Overdrive Switch-automatic Transmission
OD OVRD LAMP	Overdrive Override Lamp
OD OVRD SW	Overdrive Override Switch

PID	Extended Description
OD SOL	Overdrive Solenoid
ODM1 OVRTEMP	Overdrive Module 1 Overtemp
ODM2 OVRVOLTS	Overdrive Module 1 Over Voltage
ODO SNC CL	Odometer Since Last Code Cleared
ODOMETER	Odometer
OIL CHNG LMP	Change Oil Lamp
OIL LIFE(%)	Oil Life %
OIL PRES(PSI)/(KPA)	Oil Pressure
OIL PRES GAUGE	Oil Pressure Gauge
OIL PRES SW	Oil Pressure Switch
OIL PRS GAUGE	Oil Pressure Gauge
OIL TEMP(°F)/(°C)	Oil Temperature
OLDEST FLT	Oldest Fault Since Reset
OND DTC CNT	Total Number of On-demand Codes
OPEN LOOP	Open Loop
OSS	Output Shaft Speed
OTPT SHFT	Output Shaft Speed
OUT TOOTH CNT	Output Tooth Counter - MSW of Dbl Word
OUTPUT SFT	Output Shaft Speed
OUTSID AIR	Outside Air Temperature
OUTSIDE AIR	Outside Air Temperature
OVERDRIVE EN	Overdrive Engaged
OVERDRIVE SOL	Overdrive Solenoid
PARK/NEUTRAL SW	Park / Neutral Switch
PASS CNTR	Pass Counts
PASS COUNTER	Pass Counts
PASS KEY FL	Pass Key Fuel
PASS MIS FAIL	Misfire Test Passes Since 1st Fail
PASSKEY	Passkey II Input Time Period
PASSKEY INPUT	Pass Key Input
PASSKEY STARTER	Pass Key Starter
PC ENABLED	PC Solenoid Enabled
PC REF	PC Reference Current Force Motor
PCS CUR ER	PC Solenoid Current Error
PCS DES	PC Solenoid Desired Current
PCS DUTY CYCLE	PC Solenoid Duty Cycle
PCS REF	Transmission Pressure Control Solenoid Reference Current
PCM ACTUAL	Transmission Pressure Control Solenoid/Actual Value
PCM RESET	PCM Reset
PCV SOLENOID	Positive Crankcase Ventilation Solenoid
PEDAL ROTAT	Percent Pedal Rotation
PEDAL ROTATION	Percent Pedal Rotation
PFE	PFE
PIDS SUPPOR	PTO Supported
P/N SWITCH	Park Neutral Position Switch
PNP	Park Neutral Pressure Switch
PNP SWITCH	Park Neutral Position Switch
PORT THRO REQ	Port Throttle Request
PORT THROTS	Port Throttles
PORT VAC(V)	Port Vacuum Voltage
PRES CTRL	Pressure Control Actual Current
PRES GEAR	Present Gear Ratio
PRES SW ERR CTR	Pressure Switch Error Counter
PRES TOR SIG	Pressure Torque Signal

PID	Extended Description
PRES TORQ	Pressure Torque Signal
PRESENT GEAR	Present Gear Ratio
PRESSURE(V)/(PSI)/(KPA)	Pressure
PRNDL	Park, Reverse, Neutral, Drive, Low Lever (Gearshift Lever Position)
PRNDL SWITCH	Park, Reverse, Neutral, Drive, Low Switch
PROD MY	Production Model Year
PRO STEER MTR	Pro Steering Motor
PROM ID	Programmable Read-Only Memory Identification
PS LOAD SW	Power Stearing Load Switch
PS PRESS SW	Power Steering Pressure Switch
PS PRESS(V)/(PSI)/(KPA)	Power Steering Pressure
PSP	Power Steering Load Present
PSPS	Power Steering Pressure Switch
PTO STATUS	Power Take Off Status
PTU SOLENOID	Power Take Up Solenoid
PURGE A/D	Purge Adaptive
PURGE DC	Purge Solenoid Duty Cycle (non-linear)
PURGE FDB	Purge Current Feedback
PURGE LEARN	Purge Learned Memory
PURGE LRN B1	Purge Learn Memory Bank 1
PURGE LRN B2	Purge Learn Memory Bank 2
PURGE MON	Purge Monitor
PURGE SOL	Purge Solenoid
PWM O2S HTR	Pulse Width Modulated Oxygen Sensor Heater
PWR DWN	Power Down Timer
PWR ENRICH	Power Enrich
QUAD DRIVER 1	Quad Driver Status
QUAD DRIVER 2	Quad Driver Status
QUAD DRIVER 3	Quad Driver Status
QUAD DRIVER 4	Quad Driver Status
R PSHAFT	Rear Propshaft Speed
R/L AVG TIME	Rich To Lean Average Time
R/L L/R RT	Rich/Lean To Lean/Rich Ratio
R/L TRANS	Rich/Lean Transitions
R-L FLAG	Rich - Lean Flag
R-L STAT B1S1	Rich To Lean Status Bank 1 Sensor 1
R-L STAT B1S2	Rich To Lean Status Bank 1 Sensor 2
R-L STAT B1S3	Rich To Lean Status Bank 1 Sensor 3
R-L STAT B2S1	Rich To Lean Status Bank 2 Sensor 1
R-L BNK 1	Rich / Lean Bank 1
R-L BNK 2	Rich / Lean Bank 2
RAD FAN RELAY	Radiator Fan Control Relay
RAD FAN RLY	Radiator Fan Control Relay
RAD TEMP	Radiator Output Temperature
REAR COMMAND	Rear Command
REAR O2S	Rear Oxygen Sensor Volts
REAR SENSED	Rear Sensed
REAR SLIP	Rear Slippage
REDUCED ENG PWR	Reduce Engine Power
REF HIGH	Reference High Voltage
REF LOW	Reference Low Voltage
REF PULSE	Reference Pulse
REL FRP	Relative Fuel Rail Pressure
REL TPS	Relative Throttle Position

PID	Extended Description
REV INHIBIT	Reverse Inhibit
REV LCKOUT SOL	Reverse Gear Lockout Solenoid
REV LOCKOUT SOL	Reverse Gear Lockout Solenoid
REV MISF	Revolutions With Misfire
RF COMMAND	Right Front Command
RF SENSED	Right Front Sensed
RF SOL STATUS	Right Front Solinoid Status
RF WHEEL SPD	Right Front Wheel Speed
RF WHL STATUS	Right Front Wheel Status
RIDE CTRL	PCM Ride Control
RIDECTL DR H	Ride Control Driver High
RIDECTL DR L	Ride Control Driver Low
RO2 CROS CNT	Right Oxygen Crossover Counts
RPM DIFRNTIAL	RPM Differential
RPM PASSES/FAILED	RPM Test Pass/fail
RR TCS SOL	Right Rear Traction Control System Solinoid
RR TCS STATUS	Right Rear Traction Control System Status
RR WHEEL SPD	Right Rear Wheel Speed
R TCS COMMAND	Right Traction Control System Command
R TCS SENSED	Right Traction Control System Sensed
RSET TMR	Reset Timer
RUN FL MODE	Run Fuel Mode
RUN SPK MDE	Run Spark Mode
RUN TIME	Run Time Minutes:Seconds
S FL TM AV1	Short Term Fuel Truim Average Bank 1
S FL TM AV2	Short Term Fuel Truim Average Bank 2
S RUN TUNE VLV	S Run Time Valve
S/C A2D SW	Speed Control Switch Input
S/C POWER	Cruise, Speed Control Power
S/C PWR RELAY	Cruise, Speed Control Power Relay
S/C SERV SOLS	Cruise, Speed Control Servo Solenoids
S/C SERVO SOL	Cruise, Speed Control Servo Solenoid
S/C TGT	Cruise, Speed Control Target
S/C VAC SOL	Cruise, Speed Control Vacuum Solenoid
S/C VENT SOL	Cruise, Speed Control Vent Solenoid
S/C VNT SOL	Cruise, Speed Control Vent Solenoid
SC BOOST	Supercharger Boost Solenoid
SC BOOST SOL	Supercharger Boost Solenoid
SCI DTC1 KEY ON	SCI DTC 1 Key-on Information
SCI DTC2 KEY ON	SCI DTC 2 Key-on Information
SCI DTC3 KEY ON	SCI DTC 3 Key-on Information
SD-S APT 2ND	Steady State Adapt - 2nd Gear
SD-S APT REV	Steady State Adapt Reverse
SEC AIR MON	Secondary Air Monitor
SEC AIR SOL	Secondary Air Solenoid
SECOND AIR	Secondary Air Pump Status
SECOND AIR SOL	Secondary Air Solenoid
SECONDARY AIR	Secondary Air Monitor Completed This Driving Cycle
SEEDKEY COM INV	Seed Key Communication Invalid
SEEDKEY COMM	Seed Key Communication Valid
SEQ FIRE MDE	Sequential Firing Mode
SER SPK RET	Service Spark Retard
SERVC NOW LT	Service Engine Now Light
SET SYNC MD	Set Zyncronization Mode

PID	Extended Description
SET SYNC MODE	Set Zyncronization Mode
SF APT-D HI	Garage Shift Adapt-drive High
SF APT-D LO	Garage Shift Adapt-drive Low
SF APT-R HI	Garage Shift Adapt-reverse High
SF APT-R LO	Garage Shift Adapt-reverse Low
SF TM PRES	Shift Time Pressure Error
SHFT ADAP	Shaft Adapt Pressure
SHFT DELY	Shift Delay
SHFT MODE SW	Shift Mode Switch
SHIFT IND LAMP	Shift Indicator Lamp
SHFT MODE SW	Shift Mode Switch
SHIFT ADAPT	Shift Adapt Pressure
SHIFT DELAY	Shift Delay
SHIFT PRES	Shift Pressure
SHIFT PRES ERROR	Shift Time Pressure Error
SHIFT RPM	Shift RPM
SHIFT SOL 1	Shift Solenoid 1
SHIFT SOL 2	Shift Solenoid 2
SHIFT SOL 3	Shift Solenoid 3
SHIFT SOL 4	Shift Solenoid 4
SHIFT SOL A	Shift Solenoid A
SHIFT SOL B	Shift Solenoid B
SHIFT SOL C	Shift Solenoid C
SHIFT TOR	Shift Torque
SINGLE FIRE	Single Fire Mode
SKIP SHIFT	Skip Shift
SKIPSHFT CNTL	Skipshift Control
SKIPSHFT ENA	Skipshift Enabled
SLIP APT PWM	Slip Adapt PWM
SNC CODE CL	Mileage Since Last Code Clear
SNC ENG START	Time Since Engine Start
SNC START	Time Since Engine Start
SOFT ID	Software Version #
SPARK	Spark Advance
SPARK ADV	Spark Advance
SPARK RETARD	Spark Retard
SPARK TOTAL(°)	Total Spark Advance
SPARKTOTAL	Total Spark Advance
SPD CNTL PWR	Speed Control Power
SPD CTRL	Speed Control
SPD CTRL VAC	Speed Control Vacuum Solenoid
SPD CTRL VACSOL	Speed Control Vacuum Solenoid
SPD CTRL VENT	Speed Control Vent Solenoid
SPD CTRL VNTSOL	Speed Control Vent Solenoid
SPD RAT ERR CNT	Speed/Ratio Error Counter
SPCTL STAT	Speed Control Status
SPCTL TGT	Speed Control Target Speed
SPDCTRL SW	Speed Control Switch
SPDCTRL TRGT	Speed Control Target Speed
SPEED RATIO	Speed Ratio
SPK ADV OFF	Spark Advance Offset
SPKADV CYL1	Spark Avance Cylinder 1
SPKADV CYL2	Spark Avance Cylinder 2
SPKADV CYL3	Spark Avance Cylinder 3

PID	Extended Description
SPKADV CYL4	Spark Avance Cylinder 4
SRI LAMP	Since Reset Indicator Lamp
SRV SOL	SRV Solenoid
SRV THROT	Service Throttle Soon Lamp
SS CTCH SLP	Transmission Steady State Clutch Slip Speed
SS1	Shift Solenoid 1
SS2	Shift Solenoid 2
SS3	Shift Solenoid 3
SS1 DRVR H	Shift Solenoid 1 Driver High
SS1 DRVR L	Shift Solenoid 1 Driver Low
SS2 DRVR H	Shift Solenoid 2 Driver High
SS2 DRVR L	Shift Solenoid 2 Driver Low
SS SLIP	Steady State Slip
SS SLIP S	Transmission Steady State Clutch Slip Speed
ST FTRM	Bank, Short Term Air To Fuel Ratio Correction Factor
ST FTRM1	Bank 1 Short Term Air To Fuel Ratio Correction Factor
ST FTRM2	Bank 2 Short Term Air To Fuel Ratio Correction Factor
ST FTRM AV1	Short Term Fuel Trim Average Bank 1
ST FTRM AV2	Short Term Fuel Trim Average Bank 2
ST FL TRM 1	Short Term Fuel Trim Bank 1
ST FL TRM 2	Short Term Fuel Trim Bank 2
ST FL TRM AV1	Short Term Fuel Trim Average Bank 1
ST FL TRM AV2	Short Term Fuel Trim Average Bank 2
ST FT B1	Short Term Fuel Trim Bank 1
ST FL B2	Short Term Fuel Trim Bank 2
ST FUEL TRIM	Short-term Fuel Trim
ST FUEL TRM L	Short-term Fuel Trim Left
ST FUEL TRM R	Short-term Fuel Trim Right
STARTER COMDED	Command Starter
STARTER RELAY	Starter Relay Status
STARTS SNC 2ND F	# Of Starts since 2nd To Last Fault
STARTS SNC 3RD F	# Of Starts since 3rd To Last Fault
STARTS SNC LST F	# Of Starts since Last Fault
STD ST ACCUM	Steady State Accumulator
STD ST ADAPT	Steady State Adapt Pressure
STDY ST MODE	Steady State Mode
STDY ST TAP	Steady State Transmission Adaptive Pressure
STOP TESTS	Stop All Tests
SURGE VLV SOL	Surge Valve Solenoid
SWCHD BATT+	Switched Battery
SYNC SIG(°)	Synchronization Signal Phasing - PCM
T/BODY TEMP	Throttle Body Temperature Sensor
TAC MOD CAL ID	TAC Module Calibrated Identification
TAC MOD S/2 LEV	Tac Module S/2 Level
TACH DRVR H	Tachometer Driver High
TACH DRVR L	Tachometer Driver Low
TACH OUTPUT	Tachometer Output
TACHOMETER	Tachometer Output
TCC	Torque Converter Clutch
TCC APPLIED	Torque Converter Clutch Applied
TCC APPLY	Torque Converter Clutch Apply Time
TCC BRAKE SW	Torque Converter Clutch Brake Switch
TCC BRK-IN	Torque Converter Clutch Break-In Complete
TCC COMMAN	Torque Converter Clutch Commanded

PID	Extended Description
TCC COMMAND	Commanded Torque Converter Clutch
TCC CONTROL	Torque Converter Clutch Control
TCC DELAY	Torque Converter Clutch Delay
TCC DRVR H	Torque Converter Clutch Solenoid Driver High
TCC DRVR L	Torque Converter Clutch Solenoid Driver Low
TCC DTY CYCL	Torque Converter Clutch Duty Cycle
TCC DUTY CYC	Torque Converter Clutch Duty Cycle
TCC DTCY OSG	Torque Converter Clutch Duty Cycle Open / Short To Ground
TCC DTCY STP	Torque Converter Clutch Duty Cycle Short To Volts
TCC ENABLE	Torque Converter Clutch Enable
TCC ENGAGED	Torque Converter Clutch Engaged
TCC FULL LOCK	Torque Converter Clutch - Fully Locked-Up
TCC LOCKUP	Torque Converter Clutch Lockup
TCC DTCY OSG	Torque Converter Clutch Duty Cycle Open / Short To Ground
TCC MODE	Torque Converter Clutch Mode
TCC PWM	Torque Converter Clutch PWM Duty Cycle
TCC RAMP	Torque Converter Clutch Ramp
TCC REL PRES	Torque Converter Clutch Release Pressure
TCC REL SW	Torque Converter Clutch Release Switch
TCC SLIP	Torque Converter Clutch Slip Speed
TCC SLIP DES	Desired Slip Across Torque Converter
TCC SOL	Torque Converter Clutch Solenoid
TCC SOLENOID	Torque Converter Solenoid
TCC SPD RAT	Speed Ratio Across Torque Converter
TCC STR TMP	Torque Converter Clutch Stator Temperature
TCC1	Torque Converter Clutch 1
TCC2	Torque Converter Clutch 2
TCCSLIPDES	Desired Slip Across Torque Converter
TCIL	Transmission Control Indicator Lamp
TCM CAL ID	Transmission Control Module Calibration Identification
TCM DTC	Electronic Automatic Transaxle Diagnostic Trouble Code Is Present
TCM IGN 1	Transmission Control Module Ignition 1
TCM REQ MIL ON	Electronic Auto Transaxle Requesting Malfunction Indicator Lamp ON
TCM SOFTW ID	TCM Software Identification
TCS	Transmission Control Switch
TCS COMMAND	Traction Control System Command
TCS DEL TOR	Traction Control Delivered Torque
TCS EBTCM	Traction Control System Electronic Body Traction Control Module
TCS EN RELAY	Traction Control System Engage Relay
TCS MODE	Traction Control System Mode
TCS LT FLASH	Traction Control System Light Flash
TCS PWM INP	Traction Control System PWM Input
TCS SENSED	Traction Control System Sensed
TCS SPK RTRD	Tcs Spark Retard
TCS STATE	Traction Control System State
TCS WARN LT	Traction Control System Warning Light
TDC OFFSET	Tdc Offset
TELLTALE CKT	Telltale Circuit
TFP SWITCH A	Transmission Fluid Pressure Switch A
TFP SWITCH B	Transmission Fluid Pressure Switch B
TFP SWITCH C	Transmission Fluid Pressure Switch C
TFT	Transmission Fluid Temperature
THEFT ALARM	Theft Alarm
THR POS B	Throttle Position B

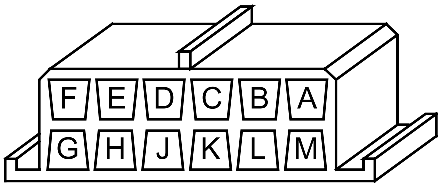
PID	Extended Description
THR POS C	Throttle Position C
THROT AT IDLE	Throttle at Idle
THROT BODY	Throttle Body
THROT CMD	Commanded Throttle Actuator Control
THROT KICKER	Throttle Kicker
THROT OPEN (%)	Relative Throttle Position
THROTTLE POS DES	Percent Desired Throttle Position
THROTTLE(%)	Throttle %
THRT/BODY (°F)/(°C)	Throttle Body Temperature
THRT/BODY(V)	Throttle Body Temperature Sensor
THS 3-2	THS 3-2
THS 3-4	THS 3-2
TOR SPK RET	Torque Management Spark Retard
TORQ DLVRED	Torque Output
TORQ REDCT LNK	Torque Reduction Link
TORQUE CNV +SLIP	Positive Slip Across Torque Converter
TORQUE DELIVERED	Delivered Torque Engine To Transmission Input
TORQUE DES BRAKE	Desired Torque Brake To PCM
TORQUE REQ	Torque Requested
TOT (C or F)	Transmission Oil Temperature
TOT (V)	Thermister Voltage
TOT KNOCK RET	Transmission Oil Temperature Knock Retard
TOT SLIP	Total Slippage
TOTAL MISF	Total Misfire
TOTAL SLIP	Total Slippage
TOT-TR OIL (°F)/(°C)	Transmission Oil Temperature
TOW/HAUL MODE	Tow Haul Mode
TP ANGLE	Throttle Position Angle
TP CLS POS	Closed Throttle Position
TP CLSD POS	Closed Throttle Position
TP DELTA	Throttle Position Delta
TP LRN CUR	Throttle Position Learn This Ignition Cycle
TP LRND LST	Throttle Position Learn Last Ignition Cycle
TP MAX ANG	Maximum Throttle Angle
TP MIN ANG	Minimum Throttle Angle
TP MODE	Throttle Position Mode
TP RANGE	Throttle Position Range
TPCT	Throttle Position Closed Throttle
TPS	Throttle Position Sensor
TPS (V)	Throttle Position Sensor Voltage
TPS 1	Throttle Position Sensor 1
TPS 2	Throttle Position Sensor 2
TPS A/D	Throttle Position Sensor A/D
TPS AT SHIFT	Throttle Angle at Shift
TPS CORR	Throttle Position Correction
TPS DES	Throttle Position Desired Angle
TPS LEARNED	Throttle Position Sensor Learned Correction Factor
TPS MIN (V)	Minimum Throttle Position Sensor Voltage
TPS NORM	Throttle Position Sensor Normalized
TPS SENSOR(V)	Throttle Position Sensor Voltage V
TR	Transmission Range Prndl Position
TR FRC MT	Throttle Position Force Motor Pressure
TR SWITCH A	Transmission Switch A
TR SWITCH B	Transmission Switch B

PID	Extended Description
TR SWITCH C	Transmission Switch C
TR SWITCH P	Transmission Switch P
TRAC CNTRL	Traction Control
TRANF CS RAT	Transfer Case Ratio
TRANS CASE LOCK	Transfer Case Lock
TRANS FAN RELAY	Transmission Fan Relay
TRANS ISS	Transmission Input Speed Sensor
TRANS OSS	Transmission Output Speed Sensor
TRANS PRESS	Transmission Pressure
TRANS PWR RELAY	Transmission Power Relay
TRANS RELAY TEST	Transmission Relay Test
TRANS RELAY TST	Transmission Relay Test
TRANS TEMP (°F)/(°C)	Transmission Temperature
TRANS TEMP(V)	Transmission Temperature Sensor
TRANS TMP HOT	Transmission Temperature Hot
TRBN SPD	Turbine Speed
TRIPS SNC CLR	Warmups Since Erased
TRIP SNC MIL	Trip Counter Since MIL Fault
TRN FRC MTR	Transmission Force Motor Pressure
TRN INP SPD	Transmission Input Speed
TRN OUT SPD	Transmission Output Speed
TRNS DIA CODE	Transmission Diagnostic Code Set
TRNS HOT MDE	Transmission Hot Mode
TRNS OIL LF	Transmission Oil Life
TRNS OIL LIFE	Transmission Oil Life
TRNS OVRTMP LMP	Transmission Overtemp Lamp
TRNS TEMP ST	Transmission Temperature State - Cold
TROUB CODE	DTC That Set Freeze Frame
TROUBLE CODE	DTC That Set Freeze Frame
TRQ MNGT FLT	Torque Management Fault Counter
TRQ MNGT FS	Torque Management Failsafe Timer
TSS	Turbine Shaft Transmission Speed
TTL KNOCK	Total Knock Retard
TTL SLIP	Total Slippage
TURBINE SPD	Turbine Speed
TURBINE(RPM)	Turbine RPM
TURBO BOOST	Turbo Boost Pressure
TWC PROTEC	Three Way Catalyst Protection
UD CLUTCH	Underdrive Clutch
UD CLUTCH ST	Underdrive Clutch State
UD CL VOL IND	Underdrive Clutch Volume Index
UD PRESS SW	Underdrive Pressure Switch
UD SOL	Underdrive Solenoid
UPSFT DES	Upshift Desired
UPSFT REQ	Upshift Requested
UPSHIFT	Upshift
VAC BREAK SOL	Vacuum Break Solenoid
VACBOOST ("HG)/(KPA)	Vacuum/boost Pressure
VACUUM ("HG)/(KPA)	Manifold Absolute Pressure
VACUUM CAL	Calculated Vacuum
VALET MDE ACT	Valet Mode Active
VALET MDE REQ	Valet Mode Requested
VATS STATUS	Vehicle Anti-theft System Status
VEH PWR(V)	Vehicle Power

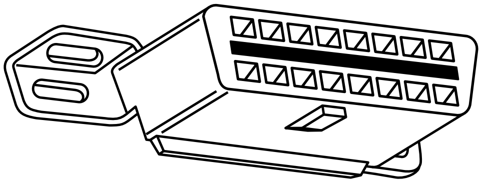
PID	Extended Description
VEH SPEED	Vehicle Speed Sensor
VEH VELOCITY	Vehicle Speed Sensor
VEHSPEED	Vehicle Speed
VFS FDBCK	VFS Feedback Input
VH SPEED	Vehicle Speed Sensor
VNT #3 SOL	Vent #3 Solenoid
VOTE	Vote Counting System
VPP44 FL SHUTOFF	VP 44 Fuel Shutoff
VPWR	Vehicle Power Battery Voltage
VREF	Vehicle Reference Voltage
VSS	Vehicle Speed Sensor
VSS DELTA	Vehicle Speed Sensor Delta
VTD FL DISAB	VTD Fuel Disable
VTD FL ENA PCM	PCM/TCM in VTD Fail Enable
VTD PASSWORD	Vehicle Theft Deterrent Password
WAC-A/C OFF	Wide-open A/C Cutoff
WAIT TO STRT LMP	Wait To Start Lamp
WASTEGATE (%)	Wastegate Solenoid Duty Cycle
WASTEGATE SOL	Waste Gate Solenoid
WASTEGATE(%)	Wastegate %
WATER INJECT	Water Injection
WATER/FUEL (V)	Water-in-fuel Sensor Signal
WOT	Wide-open Throttle
WOT A/C OFF	A/C Off For Wide Open Throttle
WOT SWITCH	Wide-open Throttle Switch
WSTGATE BYPSS	Wastegate Bypass
WSGATE SOL	Wastegate Solenoid
WSGATE SOL 2	Wastegate Solenoid # 2
WU CYCLE COMP	Warm Up Cycle Counter
WU HO2S 1-2	Heated Oxygen Warm Up Bank 1 Sensor 2
WU WO EMIS FLT	Warm Up Cycles Without Emission Faults
WU WO N-EMIS FLT	Warm Up Cycles Without Non-emission Faults

Appendix B – Data Link Connectors

GM Cars, Light Trucks & Vans



ALDL DLC



OBD II (J1962) DLC

94-95 GM Cars, Light Trucks & Vans

Model	Engine	VIN	Year	DLC Adapter
Achieva	2.3L DOHC PFI	A, D	94	ALDL
		D	95	OBD II
	2.3L SOHC PFI	3	94	ALDL
	3.1L SFI	M	94-95	ALDL
Aurora	4.0L SFI	C	95	OBD II
Beretta/Corsica	2.2L TBI	4	94-95	ALDL
	2.3L DOHC	A	94	ALDL
	3.1L PFI	M	94-95	ALDL
Camaro, Firebird, Trans Am	3.4L PFI OHV	S	94-95	ALDL
	3.8L SFI	K	95	OBD II
	5.7L PFI	P	94	ALDL
			95	ALDL/OBD II
Caprice / Impala	5.7L TBI, MFI	P	94, 95	ALDL, OBD II
	4.3L V-8 MFI	W	94-95	ALDL
Cavalier	2.2L TBI, SFI	4	94, 95	ALDL, OBD II
	2.3L DOHC	D	95	OBD II
	3.1L SFI	T	95	ALDL
Century	2.2L	4	95	ALDL
	3.1L	M	94-95	ALDL
Concours	4.6L OHC	Y, 9	94-95	ALDL
	4.9L SFI	B	94	ALDL
Corvette	5.7L OHC (ZR-1)	J	94-95	OBD II
	5.7L PFI, SFI	P	94-95	OBD II
Cutlass Ciera	2.2L PFI	4	94-95	ALDL
	3.1L SFI	M	94-95	ALDL
Cutlass Supreme	3.1L MFI, SFI	M	94-95	ALDL
	3.4L OHC SFI	X	94-95	ALDL
DeVille	4.6L OHC	Y, 9	94-95	ALDL
	4.9L PFI	B	94-95	ALDL
Eighty-Eight, Ninety-Eight, Park Avenue, Bonneville	3.8L SFI	L, K	94-95	OBD II
	3.8L SFI SC	1	95	OBD II
Eldorado, Seville	4.6L OHC	Y, 9	94-95	ALDL
Fleetwood	4.6L OHC	Y, 9	94-95	ALDL
	5.7L TBI, SFI	P	94-95	ALDL
Grand Am	2.3L PFI DOHC	A, D	94-95	ALDL
	2.3L PFI SOHC	3	94	ALDL
	3.1L SFI	M	94-95	ALDL

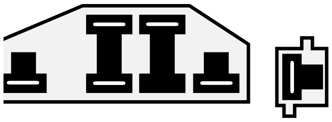
Note: *Data link connectors (DLC) are located under the dash, near the steering wheel.*

94-95 GM Cars, Light Trucks & Vans

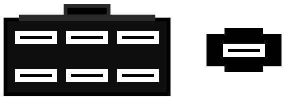
Model	Engine	VIN	Year	DLC Adapter
Grand Prix	2.3L DOHC	D	94-95	OBD II
	3.1L MFI	M	94-95	ALDL
	3.4L PFI OHC	X	94-95	ALDL
LeSabre	3.8L MFI	L	94-95	OBD II
Lumina, Monte Carlo	3.1L PFI, SFI	M, T	94-95	ALDL
	3.4L MFI OHC	X	94-95	ALDL
Regal	3.1L MFI	M	94-95	ALDL
	3.8L SFI, MFI	L	94-95	ALDL
Riviera	3.8L MFI	K	95	OBD II
	3.8L SFI SC	1	95	OBD II
Roadmaster	5.7L	P	94-95	ALDL
Saturn SC1, SL, SL1, SW1	1.9L SOHC	8	94-95	ALDL
Saturn SC2, SL, SL2, SW2	1.9L DOHC	7	94-95	ALDL
Skylark	2.3L DOHC	D	95	ALDL
	2.3L SOHC	3	94	ALDL
	3.1L	M, T	94-95	ALDL
	3.8L MFI	K	95	OBD II
Sunbird	3.1L PFI	T	94	ALDL
Sunfire	2.0L TBI OHV	H	94	ALDL
	2.2L MFI	4	95	OBD II
	2.3L PFI DOHC	D	95	OBD II
C Series 4x2 & K series 4x4 ***Conventional Cab*** *Pickup, Sierra, Blazer, Suburban, Yukon & Tahoe*	4.3L TBI	Z	94-95	ALDL
	5.0L TBI	H	94-95	ALDL
	5.7L TBI	K	94-95	ALDL
	6.5L Diesel	P	94-95	ALDL
	6.5L Turbo diesel	F	94-95	ALDL
	7.4L TBI	N	94-95	ALDL
G series 4x2 ***Van (full size)*** *Chevy van, Sport van, GMC Vandura and Rally*	4.3L TBI	Z	94-95	ALDL
	5.0L TBI	H	94-95	ALDL
	5.7L TBI	K	94-95	ALDL
	6.5L Diesel	P, Y	94-95	ALDL
	7.4L TBI	N	94-95	ALDL
M series 4x2 & L series 4x4, ***Small Van,*** *Astro, Safari*	4.3L CPI	W	94-95	ALDL
	4.3L TBI	Z	94	ALDL
P series 4x2 ***Forward Control*** *Parcel/Delivery commercial vans, Motorhomes*	4.3L TBI	Z	94-95	ALDL
	5.7L TBI	K	94-95	ALDL
	6.5L Diesel	Y	94	ALDL
	6.5L Turbo Diesel	F	94-95	ALDL
	7.4L TBI	N	94-95	ALDL
S series 4x2 & T series 4x4 ***Small Conventional Cab,*** *Blazer, Bravada, Jimmy, Pickup & Sonoma*	2.2L MFI	4	94-95	OBD II
	4.3L CPI	W	94 95	ALDL OBD II
	4.3L TBI	Z	94 95	ALDL OBD II
U & X series 4x2 ***All Purpose Vehicle,*** *Lumina APV, Silhouette, Trans Sport*	3.1L TBI	D	94-95	ALDL
	3.8L PFI	L	94-95	ALDL

Note: *Data link connectors (DLC) are located under the dash, near the steering wheel.*

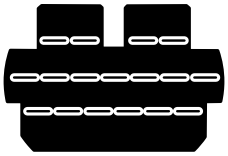
Ford, Lincoln & Mercury Cars, Light Trucks & Vans



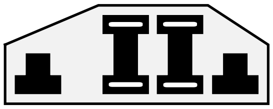
EEC-IV DLC



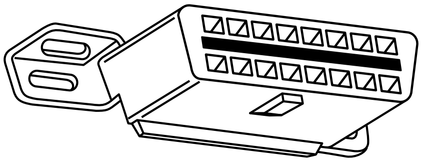
MECS 6-Pin DLC
Optional P/N 9603



MECS 17-Pin DLC
Available from Dealership



MCU DLC



OBD II (J1962) DLC

Ford, Lincoln & Mercury Cars, Light Trucks & Vans

Model	Engines	Year	DLC	DLC Location
Aspire	1.3L	94-95	MECS 17	Engine compartment, left rear corner
Capri	1.6L, 1.6L T	91-94	MECS 6	Engine compartment, right rear corner.
	2.3L, 2.3L T, 3.8L, 5.0L, 5.0LHO	84-86	EEC-IV	Engine compartment, left rear corner.
Continental	3.8L, 4.6L, 5.0L	88 89-94	EEC-IV	Engine compartment, right corner near firewall. Right rear of engine compartment.
	4.6L	95	OBD II	Below instrument panel right of steering wheel.
Contour	2.0L, 2.5L	95	EEC-IV	Engine compartment, left side by shock tower.
Cougar	2.3L, 2.3L T, 3.8L, 5.0L, 5.0LHO	84-85 86-90 91-95	EEC-IV	Right inner fender of engine compartment Engine compartment, in front of left shock tower. Engine compartment, in front of right shock tower.
	4.6L	94-95	OBD II	Below instrument panel to right of steering wheel.
Escort /Lynx/ EXP	1.6L, 1.6L Turbo, 1.9L	84-90 91-95	EEC-IV* EEC-IV	Right fender apron near firewall and shock tower. Engine compartment, left rear corner.
Escort	1.8L	91-95	MECS 17	Engine compartment, left rear corner near firewall.
Festiva	1.3L	90-93	MECS 6	Engine compartment, left rear corner.
Grand Marquis, Crown Victoria, Colony Park, Country Squire	4.6L, 5.0L	84 85-94	EEC-IV*	Above right wheel well. Front Left fender apron above wheelwell.
	4.6L	95	OBD II	Below instrument panel to right of steering wheel.
Grand Marquis/ Crown Victoria (Police)	5.8L	84 85-91	MCU	Above right wheel well. Front of left fender apron above wheelwell.

** Early models are equipped with the EEC III diagnostic system which is not supported by this tool.*

Ford, Lincoln & Mercury Cars, Light Trucks & Vans

Model	Engines	Year	DLC	DLC Location
Marquis/LTD	2.3L, 3.8L	84-86	EEC-IV	Engine compartment, left rear corner.
Mark VII	5.0L, 5.0L HO	84-89 90-92	EEC-IV*	Engine compartment, right corner near firewall Front of right fender apron.
Mark VIII	4.6L	93-95	EEC-IV	Engine compartment on top of left wheel well.
Mustang	2.3L,2.3L Turbo, 5.0L, 5.0L HO, 5.0L SHP	84-85 86-93 94-95	EEC-IV	Center of left fender apron. Left rear corner of engine compartment on shock tower. Rear of right shock tower.
	3.8L	84-85 86-93	EEC-IV	Center of left fender apron. Left rear corner of engine compartment on shock tower.
	3.8L	94-95	OBD II	Below left side of glove compartment.
Mystique	2.0L, 2.5L	95	EEC-IV	Left side of engine compartment near shock tower.
Probe	2.0L (A/T only in 93)	93 93-95	MECS 17 EEC-IV	Left rear of engine compartment near strut tower. Left rear of engine compartment near strut tower.
	2.2L, 2.2L Turbo	89-92	MECS 6	Left rear of engine compartment near strut tower.
	2.5L	93-95	MECS 17	Left front of engine compartment near battery.
	3.0L	91-92	EEC-IV	Left rear of engine compartment near strut tower.
Sable	3.0L, 3.8L	86-87 88-95	EEC-IV	Engine compartment near alternator. Right rear corner of engine compartment.
Scorpio	2.9L	87-89	EEC-IV	Engine compartment, right rear corner.
Taurus	2.5L, 3.0L FF, 3.0L, 3.0L SHO, 3.2L, 3.8L	86-87 88-95	EEC-IV	Engine compartment near alternator. Right rear corner of engine compartment.
Tempo / Topaz	2.3L HSC, 2.3L HSO, 3.0L	84-92 93-94	EEC-IV	Right rear corner of engine compartment. Left strut tower.
Thunderbird	2.3L, 2.3L T, 3.8L, 3.8L SC, 5.0L, 5.0L HO	84-85 86-90 91-95	EEC-IV	Right inner fender of engine compartment Engine compartment, in front of left shock tower. Engine compartment, in front of right shock tower.
	4.6L	94-95	OBD II	Below instrument panel to right of steering wheel.
Town Car	4.6L	95	OBD II	Below instrument panel right of steering wheel.
	4.6L, 5.0L	84 85-90 91-94	EEC-IV*	Above right wheel well. Left fender apron, near or above wheelwell. Above left wheel well.

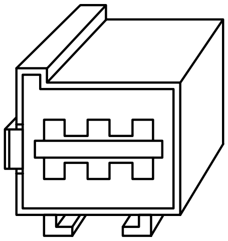
** Early models are equipped with the EEC III diagnostic system which is not supported by this tool.*

Ford, Lincoln & Mercury Cars, Light Trucks & Vans

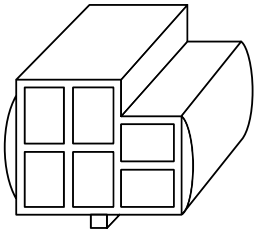
Model	Engines	Year	DLC	DLC Location
Tracer	1.8L	88-89 91-95	MECS 6 MECS 17	Engine compartment, left rear corner near firewall. Engine compartment, left rear corner near firewall.
	1.9L	91-95	EEC-IV	Engine compartment, left rear corner.
XR4Ti	2.3L Turbo	85-88	EEC-IV	Engine compartment, right fender apron above wheel well.
Aerostar	2.3L, 2.8L, 3.0L, 4.0L	86-92 93-95	EEC-IV	Left front fender below starter relay. Left rear engine compartment on firewall.
Bronco	4.9L*, 5.0L*, 5.8L* *84-85 A/T Only	84-87 88-95	EEC-IV	Right inner fender near starter relay. Left front corner of engine compartment.
Bronco II	2.8L, 2.9L	84-88 89-90	EEC-IV	Right inner fender near starter relay. Right fender panel below engine compartment fuse block.
E-Series, Econoline Van	4.9L, 5.0L, 5.8L, 7.3L D, 7.3L TD	84-91 92-95	EEC-IV	Right front fender near starter relay. Left front corner of engine compartment.
	5.8L>8,500 GVW	96	EEC-IV	Left rear of engine compartment.
	5.8L>8,500 GVW in 49 States, ex CA	97	EEC-IV	Left rear of engine compartment.
	7.5L W/Fed Emiss	96	EEC-IV	Left rear of engine compartment.
	7.5L >14,000 GVW	97-98	EEC-IV	Left front corner of engine compartment.
	7.5L >8,500 GVW in 49 States ex CA	97-98	EEC-IV	Left front corner of engine compartment.
Explorer	4.0L	91-95	EEC-IV	Right rear of engine compartment.
F-Series Pickup	4.9L, 5.0L, 5.8L, 7.3L D, 7.3L TD, 7.5L	84-87 88-95	EEC-IV	Right inner fender near starter relay. Left front fender apron in rear of engine compartment.
	5.8L > 8,500 GVW	96-98	EEC-IV	Left rear of engine compartment.
	5.8L>8,500 GVW in 49 States, ex CA	97	EEC-IV	Left rear of engine compartment.
	7.0L	91-96	EEC-IV	Left rear of engine compartment.
	7.0L > 14,000 GVW	97-98	EEC-IV	Left rear of engine compartment.
	7.5L W/Fed Emiss	96	EEC-IV	Left rear of engine compartment.
	7.5L > 8,500 GVW in 49 States ex CA	97-98	EEC-IV	Left rear of engine compartment.
	7.5L > 14,000 GVW	97-98	EEC-IV	Left rear of engine compartment.
Ranger	2.3L	84	MCU	Right front inner fender panel.
	2.3L, 2.8L, 2.9L, 3.0L, 4.0L	84-85 86-92 92-94	EEC-IV	Right front inner fender panel. Right rear fender apron near fuel pump relay. Left front inner fender by fuse/relay block.
	2.3L, 3.0L, 4.0L	95	OBD II	Below instrument panel, right of steering wheel.
Windstar	3.0L, 3.8L	95	OBD II	Below instrument panel, right of steering wheel.

** Early models are equipped with the EEC III diagnostic system which is not supported by this tool.*

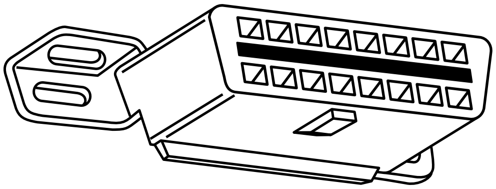
Chrysler Cars, Light Trucks & Vans



LH DLC
Optional P/N 9605



SCI DLC



OBD II (J1962) DLC

Chrysler Cars, Light Trucks & Vans

Make/Model	Year	Engine	DLC	Location
Acclaim	89-95	ALL	SCI	Front of left shock/strut tower, near the SBEC/SMEC module.
Aries K, Reliant	89	ALL	SCI	At front of left shock/strut tower.
Caravan, Grand Caravan	89-91 92-93 94-95	ALL ALL ALL	SCI SCI SCI	In front of left fender panel below relays. In engine compartment near PCM module. In engine compartment on left side of firewall.
Cherokee	91-95	ALL	SCI	In front of left fender apron behind air cleaner.
Cirrus	95	ALL	OBD II	Left of steering column under dash on body control module
Comanche	91-92	ALL	SCI	In front of left fender apron behind air cleaner.
Concorde, Intrepid, Vision	93-95	ALL	LH	Right of steering column under dash.
Dakota	91	ALL	SCI	Engine compartment, right corner of firewall
Daytona	89-93	ALL	SCI	At front of left shock/strut tower.
Dynasty	89-93	ALL	SCI	Front of left shock/strut tower near SBEC/PCM.
Fifth Avenue, Imperial	90 91-93	ALL ALL	SCI SCI	In engine compartment near air filter housing. On front of left fender panel by SMEC/SBAC.
Grand Cherokee, Grand Wagoneer	93-	ALL	SCI	Right rear of engine compartment.

Chrysler Cars, Light Trucks & Vans

Make/Model	Year	Engine	DLC	Location
Horizon, Omni	89-90	ALL	SCI	Front of left side shock tower by relays & SMEC.
Lancer	89	ALL	SCI	At front of left shock/strut tower.
LeBaron Coupe, Convertible	89-95	ALL	SCI	At front of left shock/strut tower.
LeBaron Sedan, GTS	89-95	ALL	SCI	Front of left shock/strut tower near SBEC/PCM.
LHS	94-95	ALL	LH	Right of steering column under dash.
Neon	95	ALL	OBD II	Under left side of dash.
New Yorker	89-93 94-95	ALL ALL	SCI LH	Front of left shock tower near the SBEC/SMEC module. Right of steering column under dash.
Pickup D/W, RAM series	89-95 89-95 94-95	5.2L, 5.9L 3.9L, 5.9L 8.0L	SCI SCI SCI	On left side of firewall near master cylinder. In engine compartment on right side of firewall. In engine compartment on right side of firewall.
Ram Wagon/Van, B-Van	89-90 91-95 92-95 89-95	5.2L, 5.9L 5.2L, 5.9L 5.2L CNG 3.9L	SCI SCI SCI SCI	On left side of firewall below cowl. On center of firewall next to SBEC/PCM. Under center of dash panel. In engine compartment on right side of firewall.
Ramcharger	89-90 91-93	ALL ALL	SCI SCI	On left side corner of firewall below cowl. In engine compartment, near master cylinder.
Sebring Conv/ Avenger	95	ALL	OBD II	Under left side of dash, right side of steering column.
Shadow, Sundance	89-95	ALL	SCI	Front of left shock/strut tower near SBEC/PCM.
Spirit	89-95	ALL	SCI	Front of left shock/strut tower near SBEC/PCM.
Stratus	95	ALL	OBD II	Left of steering column under dash on body control module
Town & County	90-91 92-93 94-95	ALL ALL ALL	SCI SCI SCI	On front of left fender panel below relays. In engine compartment near PCM module. In engine compartment on left side of firewall.
Voyager, Grand Voyager	89-91 92-93 94-95	ALL ALL ALL	SCI SCI SCI	In front of left fender panel below relays. In engine compartment near PCM module. In engine compartment near PCM module on left side of firewall.
Wrangler	91-95	ALL	SCI	In front of left fender apron behind air cleaner near SBEC.

Appendix C – Glossary

A/C:
Air Conditioner

A/D:
Analog to Digital

A/F:
Air/Fuel ratio. The proportion of air and fuel delivered to the cylinder for combustion. For example, an A/F ratio of 14:1 denotes 14 times as much air as fuel in the mixture. Ideally the A/F ratio is 14.7:1.

ABS:
Anti-lock Brake System

A/C Clutch Relay:
The PCM uses this relay to energize the A/C clutch, turning the A/C compressor on or off.

A/C Pressure Sensor:
Measures air conditioning refrigerant pressure and sends a voltage signal to the PCM.

A/C Pressure Switch:
A mechanical switch connected to the A/C refrigerant line. The switch is activated (sending a signal to the PCM) when the A/C refrigerant pressure becomes too low or high.

Actuator:
Actuators such as relays, solenoids, and motors allow the PCM to control the operation of vehicle systems.

Air Injection Reaction (AIR) System:
An emission control system operated by the PCM. During cold starts, an air pump injects outside air into the exhaust manifold to help burn hot exhaust gases. This reduces pollution and speeds warm-up of oxygen sensors and catalytic converters. After the engine is warm, the air will either be dumped back to the atmosphere (or into the air cleaner assembly) or sent to the catalytic converter.

APP:
Acceleration Pedal Position (Sensor)

ASR:
Acceleration Slip Regulation

Bank x:
The standard way of referring to the bank of cylinders containing cylinder #x. In-line engines have only one bank of cylinders. Most commonly used to identify the location of oxygen sensors. See **O2S**, **Sensor x**, **Sensor x**.

BARO:
Barometric Pressure Sensor. See **MAP Sensor**.

BBV:
Brake Boost Vacuum (Sensor)

BCM:
Body Control Module

Boost Control Solenoid:
A solenoid that is energized by the PCM, in order to control turbo/supercharger boost pressure.

Brake Switch Signal:
An input signal to the PCM indicating that the brake pedal is being pressed. This signal is typically used to disengage Cruise Control systems and Torque Converter Clutch (TCC) solenoids. See also **TCC**.

CAM:
Camshaft Position Sensor. Sends a frequency signal to the PCM in order to synchronize fuel injector and spark plug firing.

Catalytic Converter:
Designed to reduce exhaust emissions.

CAN:
Controller Area Network

CARB:
California Air Resources Board. Governing body for emissions control in California.

CKP REF:
Crankshaft Position Reference.

CKP:
Crankshaft Position. See **CPS**.

CKT:
Circuit

Closed Loop (CL):
A feedback system that uses the O2 Sensor(s) to monitor the results of combustion. Based on the signal(s) from the O2 sensor(s), the PCM modifies the air/fuel mixture to maintain optimum performance with lowest emissions. In closed loop mode, the PCM can fine tune control of a system to achieve an exact result.

CMP:
Camshaft Position Sensor

CO:
Carbon Monoxide; odorless gas produced by incomplete combustion.

Code Scanner:
A device that interfaces with and communicates information via a data link.

Continuous Memory Codes:
See **Pending Codes**.

CPS:
Crankshaft Position Sensor. Sends a frequency signal to the PCM. It is used to reference fuel injector operation and synchronize spark plug firing on distributorless ignition systems (DIS).

CTS:
Coolant Temperature Sensor. A resistance sensor that sends a voltage signal to the PCM indicating the temperature of the coolant. This signal tells the PCM whether the engine is cold or warm.

CVRTD:
Continuous Variable Real Time Damping

D/R:
Drive/Reverse

Data Link Connector (DLC):
Connector providing access and/or control of the vehicle information, operating conditions, and diagnostic information. Vehicles with OBD II use a 16-pin connector located in the passenger compartment.

Data Stream:
The actual data communications sent from the vehicle's PCM to the data connector.

DEPS:
Digital Engine Position Sensor.

Detonation:
See **Knock**.

DI/DIS:
Direct Ignition/Distributorless Ignition System. A system that produces the ignition spark without the use of a distributor.

DPFE:
Differential Pressure Feedback – Exhaust Gas Recirculation Sensor

DTC:
Diagnostic Trouble Code. An alphanumeric identifier for a fault condition identified by the On Board Diagnostic System.

Duty Cycle:
A term applied to signals that switch between on and off. Duty cycle is the percentage of time the signal is on. For example, if the signal is on only one fourth of the time, then the duty cycle is 25%. The PCM uses duty cycle type signals to maintain precise control of an actuator.

EBCM:
Electronic Brake Control Module

EBTCM:
Electronic Brake/Traction Control Module

ECM
Engine Control Module *or* Electronic Control Module

ECT:
Engine Coolant Temperature sensor. See **CTS**.

EEPROM:
Electrically Erasable Programmable Read Only Memory

EFE:
Early Fuel Evaporation

EFI:
Electronic Fuel Injection. Any system where a computer controls fuel delivery to the engine by using fuel injectors.

EGR:
Exhaust Gas Recirculation. The PCM uses the EGR system to recirculate exhaust gases back into the intake manifold to reduce emissions. EGR is used only during warm engine cruise conditions.

EOP:
Engine Oil Pressure (Switch)

EOT
Engine Oil Temperature (Sensor)

EPA:
Environmental Protection Agency.

ESC:
Electronic Spark Control. An ignition system function that warns the PCM when knock is detected. The PCM then retards spark timing to eliminate the knocking condition.

EST:
Electronic Spark Timing. An ignition system that allows the PCM to control spark advance timing. The PCM determines optimum spark timing from sensor information — engine speed, throttle position, coolant temperature, engine load, vehicle speed, Park/Neutral switch position, and knock sensor condition.

EVAP:
Evaporative Emissions System.

FC:
Fan Control

Freeze Frame:
A block of memory containing DTCs of the vehicle operating conditions for a specific time.

FTP:
Federal Test Procedure. Strict test of vehicle's emissions.

Ground (GND):
An electrical conductor used as a common return for an electric circuit(s) and with a relative zero potential (voltage).

Hall Effect Sensor:
Any of a type of sensor utilizing a permanent magnet and a transistorized Hall Effect switch. Hall Effect type sensors may be used to measure speed and position of the crankshaft or camshaft — for spark timing and fuel injector control.

HO2S:
Heated Oxygen Sensor. See **O2S**.

HVAC:
Heating, Ventilation & Air Conditioning (System)

I/M:
Inspection and Maintenance. An emission control program.

IAC:
Idle Air Control. A device mounted on the throttle body which adjusts the amount of air bypassing a closed throttle so that the PCM can control idle speed.

IAT:
Intake Air Temperature (Sensor)

ICM:
Ignition Control Module.

IMRC:
Intake Manifold Runner Control

IPC:
Instrument Panel Cluster

ISC:
Idle Speed Control. A small electric motor mounted on the throttle body and controlled by the PCM. The PCM can control idle speed by commanding the ISC to adjust its position.

ISO:
International Organization of Standardization also know as International Standards Organization.

KAM:
Keep Alive Memory

Knock Sensor (KS):
Used to detect engine detonation or knock. The sensor contains a piezoelectric element and is threaded into the engine block. Special construction makes the element sensitive only to engine vibrations associated with detonation.

Knock:
Uncontrolled ignition of the air/fuel mixture in the cylinder. Also referred to as detonation or ping. Knock indicates extreme cylinder pressures or “hotspots” which are causing the air/fuel mixture to detonate prematurely.

KOEO:
Key On Engine Off. Turn the ignition key to on, but don’t start the engine.

KOER:
Key On Engine Running. Start the vehicle.

LCD:
Liquid Crystal Display

LTFT:
Long Term Fuel Trim

M/T:
Manual transmission or manual transaxle.

MAF:
Mass Air Flow (sensor). Measures the amount and density of air entering the engine and sends a frequency or voltage signal to the PCM. The PCM uses this signal in its fuel delivery calculations.

MAP:
Manifold Absolute Pressure (sensor). Measures intake manifold vacuum or pressure and sends a frequency or voltage signal (depending on sensor type) to the PCM. This gives the PCM information on engine load for control of fuel delivery, spark advance, and EGR flow.

MAT:
Manifold Air Temperature (sensor). A resistance sensor in the intake manifold that sends a voltage signal to the PCM indicating the temperature of the incoming air. The PCM uses this signal for fuel delivery calculations.

MIL:
Malfunction Indicator Lamp. The MIL is most commonly known as the Check Engine or Service Engine Soon light. A required on-board indicator to alert the driver of an emission-related malfunction.

Misfire:
Caused by the air fuel ratio being incorrect.

Monitor:
A test performed by the on-board computer to verify proper operation of emission-related systems or components.

MPFI or MFI:
Multi-Port Fuel Injection. MPFI is a fuel injection system using one (or more) injector(s) for each cylinder. The injectors are mounted in the intake manifold, and fired in groups rather than individually.

NOx:
Oxides of Nitrogen. The system EGR and Camshafts injects exhaust gases into the intake manifold to reduce these gases at the tailpipe.

O2S:
Oxygen Sensor. Generates a voltage of 0.6 to 1.1 volts when the exhaust gas is rich (low oxygen content). The voltage changes to 0.4 volts or less when the exhaust gas is lean (high oxygen content). This sensor only operates after it reaches a temperature of approximately 349ºC (660ºF). O2 sensors are usually found both upstream and downstream of the catalytic converter. The PCM uses these sensors to fine tune the air-fuel ratio and to monitor the efficiency of the catalytic converter. See **Bank 1**, **Bank 2**, **Sensor 1**, **Sensor 2**.

OBD II:
On-Board Diagnostics, Second Generation. OBD II is a U.S. Government-mandated standard requiring all cars and light trucks to have a common data connector, connector location, communication protocol, DTCs and code definitions. OBD II first appeared on vehicles in late 1994, and is required to be present on all cars sold in the US after January 1, 1996.

ODM:
Output Device Monitor.

Open Loop (OL):
A control system mode that does not monitor the output to verify if the desired results were achieved. A fuel delivery system usually operates in open loop mode during cold engine warm-up because the oxygen sensors are not yet ready to send a signal. Without the oxygen sensor signal, the computer cannot check the actual results of combustion.

PCM:
Powertrain Control Module. The brains of the engine and transmission control systems housed in a metal box with a number of sensors and actuators connected via a wiring harness. Its job is to control fuel delivery, idle speed, spark advance timing, and emission systems. The PCM receives information from sensors, then energizes various actuators to control the engine. The PCM is also known as the ECM (Engine Control Module).

Pending Codes:
Also referred to as Continuous Memory codes and Maturing Diagnostic Trouble Codes. Pending Codes may be set by emission related powertrain components and systems. If the fault does not occur after a certain number of drive cycles, the code is erased from memory.

PID:
Parameter Identification. Identifies an address in memory which contains vehicle operating information.

PNP:
Park/Neutral Position. A switch that tells the PCM when the gear shift lever is in the Park or Neutral position. When in Park or Neutral, the PCM operates the engine in an idle mode.

PROM:
Programmable Read-Only Memory. The PROM contains programming information the PCM needs to operate a specific vehicle model/engine combination.

PSPS:
Power Steering Pressure Switch

Purge Solenoid:
Controls the flow of fuel vapors from the carbon canister to the intake manifold. The canister collects vapors evaporating from the fuel tank, preventing them from escaping to the atmosphere and causing pollution. During warm engine cruise conditions, the PCM energizes the Purge Solenoid so the trapped vapors are drawn into the engine and burned.

PWM:
Pulse Width Modulated

PZM:
Platform Zone Module

QDM:
Quad Driver Module

RAM:
Random Access Memory

Relay:
An electromechanical device in which connections in one circuit are switched.

Reluctance Sensor:
A type of sensor typically used to measure crankshaft or camshaft speed and/or position, driveshaft speed, and wheel speed.

ROM:
Read-Only Memory. Permanent programming information stored inside the PCM, containing the information the PCM needs to operate a specific vehicle model/engine combination.

RPM:
Revolutions Per Minute

SAE:
Society of Automotive Engineers.

Scan Tool:
A device that interfaces with and communicates information on a data link.

SDM:
Sensing and Diagnostic Module

Sensor x:
A standard term used to identify the location of oxygen sensors. Sensor 1 is located upstream of the catalytic converter. See **O2S**, **Bank 1**, **Bank 2**.

Sensor:
Any device that reports information to the PCM. The job of the sensor is to convert a parameter such as engine temperature into an electrical signal that the PCM can understand.

SFI or SEFI:
Sequential Fuel Injection or Sequential Electronic Fuel Injection. A fuel injection system that uses one or more injectors for each cylinder. The injectors are mounted in the intake manifold and are fired individually.

Solenoid:
A device consisting of an electrical coil which when energized, produces a magnetic field in a plunger, which is pulled to a central position. A solenoid may be used as an actuator in a valve or switch.

STFT:
Short Term Fuel Trim.

STS:
Service Throttle Soon

TAC:
Throttle Actuator Control

TBI:
Throttle Body Injection. A fuel injection system having one or more injectors mounted in a centrally located throttle body, as opposed to positioning the injectors close to an intake valve port. TBI is also called Central Fuel Injection (CFI) in some vehicles.

TCC:
Torque Converter Clutch

TCM:
Transmission Control Module

TCS:
Traction Control System for PCM and brakes

TDC:
Top Dead Center. When a piston is at its uppermost position in the cylinder.

TFP:
Transmission Fluid Pressure

TFT:
Transmission Fluid Temperature (Sensor)

Throttle Body:
A device which performs the same function as a carburetor in a fuel injection system. On a throttle body injection (TBI) system, the throttle body is both the air door and the location of the fuel injectors. On port fuel injection systems (PFI, MPFI, SFI, etc.), the throttle body is simply an air door. Fuel is not added until the injectors at each intake port are activated. In each case, the throttle body is attached to the accelerator pedal.

TPS:
Throttle Position Sensor. Potentiometer-type sensor connected to the throttle shaft. Its voltage signal output increases as the throttle is opened. The PCM uses this signal to control many systems such as idle speed, spark advance, fuel delivery, etc.

Traction Assist:

Assist in traction with brakes only.

Trip:

Vehicle operation for a period of time so the systems can be monitored.

TTS:
Transmission Temperature Sensor. A resistance sensor mounted in the transmission housing in contact with the transmission fluid. It sends a voltage signal to the PCM indicating the temperature of the transmission.

VECI:
Vehicle Emission Control Information. A decal located in the engine compartment containing information about the emission control systems found on the vehicle. The VECI is the authoritative source for determining whether a vehicle is OBD II compliant.

VIN:
Vehicle Identification Number. This is the factory-assigned vehicle serial number. This number is stamped on a number of locations throughout the vehicle, but the most prominent location is on top of the dashboard on the driver's side, visible from outside the car. The VIN includes information about the car, including where it was built, body and engine codes, options, and a sequential build number.

VSS:
Vehicle Speed Sensor. Sends a frequency signal to the PCM. The frequency increases as the vehicle moves faster to give the PCM vehicle speed information used to determine shift points, engine load, and cruise control functions.

C

VTD:
Vehicle Theft Deterrent

Warm-up Cycle:
Warm-up cycle is when the engine coolant temperature rises at least 40 degrees above that at engine start up.

WOT:
Wide-Open Throttle. The vehicle operating condition brought about when the throttle is completely (or nearly) open. The PCM typically delivers extra fuel to the engine and de-energizs the A/C compressor at this time for acceleration purposes. The PCM uses a switch or the TPS to identify the WOT condition.

SPX Corporation Limited Warranty

THIS WARRANTY IS EXPRESSLY LIMITED TO ORIGINAL RETAIL BUYERS OF SPX ELECTRONIC DIAGNOSTIC TOOLS (“UNITS”).

SPX Units are warranted against defects in materials and workmanship for one year (12 months) from date of delivery. This warranty does not cover any Unit that has been abused, altered, used for a purpose other than that for which it was intended, or used in a manner inconsistent with instructions regarding use. The sole and exclusive remedy for any Unit found to be defective is repair or replacement, the option of SPX. In no event shall SPX be liable for any direct, indirect, special, incidental or consequential damages (including lost profit) whether based on warranty, contract, tort or any other legal theory. The existence of a defect shall be determined by SPX in accordance with procedures established by SPX. No one is authorized to make any statement or representation altering the terms of this warranty.

DISCLAIMER

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

SOFTWARE

Unit software is proprietary, confidential information protected under copyright law. Users have no right in or title to Unit software other than a limited right of use revocable by SPX. Unit software may not be transferred or disclosed without written consent of SPX. Unit software may not be copied except in ordinary backup procedures.

ORDER INFORMATION

Order replacement and optional parts directly from your SPX authorized tool supplier. Include the quantity, part number, and item description.

Technical Service

If you have any questions about the operation of the product, call (800) 228-7667.

Repair

When sending your SPX electronic product in for repair, include the following:

- contact name
- telephone number
- description of the problem
- proof-of-purchase for warranty repairs
- preferred method of payment for non-warranty repairs

For non-warranty repairs, please call Tech Support at (800) 228-7667. You will be advised of the cost of repair and any freight charges.

Send the unit to:

SPX Service Solutions
15825 Industrial Parkway
Cleveland Ohio 44135
Attn.: Repair

© 2006-2007 SPX Corporation
All Rights Reserved.
Todos los derechos reservados.
Tous droits réservés.

P/N 0002-001-2933